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**RESULTS OF FIELD AND LABORATORY  
INVESTIGATIONS CONDUCTED  
FOR  
REMEDIATION OF INTERIM RESPONSE ACTIONS  
OTHER CONTAMINATION SOURCES  
DECEMBER 1990  
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VOLUME II - APPENDIXES**

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FOR ROCKY MOUNTAIN ARSENAL CONTAMINATION CLEANUP**

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Commerce City, Colorado**

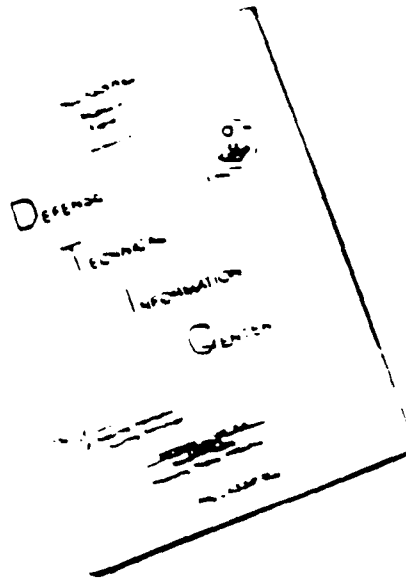
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**APPENDIX A**  
**GEOLOGY, HYDROLOGY, AND HISTORICAL CONTAMINATION STUDIES**

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**APPENDIX A  
GEOLOGY, HYDROLOGY, AND HISTORICAL CONTAMINATION STUDIES**

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This section contains details concerning the geology and hydrogeology of RMA in general and at the four hot spots investigated under this task order. Additional information concerning each site is contained in the study area reports.

**A.1 REGIONAL GEOLOGY**

The RMA occupies approximately 27 square miles within the Colorado Piedmont section of the Great Plains physiographic province. The surficial deposits of this area are characterized primarily by a veneer of wind-blown and alluvial materials. Most of the topography at the Arsenal is gently rolling; however, there are several prominent hills that contain outcrops of resistant bedrock (Costa 1982).

The Rocky Mountain Arsenal lies within the Denver Basin, one of the largest structural basins in the Rocky Mountain region. It covers approximately 60,000 square miles in portions of Colorado, Nebraska, Wyoming, and Kansas. The Denver Basin is an asymmetrical north-south trending syncline with its structural axis close to and parallel to the Front Range. Rock units on the west flank of the basin dip gently to the east though the dip becomes progressively steeper near the boundary between the Front Range uplift and the Denver Basin (Hansen 1982). The east flank of the basin generally dips to the west at one degree or less (Sonneberg 1982).

The Denver Basin is filled with approximately 15,000 feet of sediments ranging in age from Cambrian to Quaternary. Several major transgressions followed by periods of emergence resulted in the deposition of both marine and continental sediments (Haun 1965) consisting of conglomerate, sandstone, siltstone, shale, limestone, dolomite, coal, lignite, and volcanoclastic sediments. The Laramide Orogeny marked the last retreat of the marine seaway and, thus, sediments from the upper Cretaceous and the lower Tertiary record the final regression of the inland sea (Weimer 1973).

**A.1.1 Denver Formation**

The Denver Formation, which subcrops and occasionally outcrops at the Rocky Mountain Arsenal, was originally as much as 900 feet thick, but due to subsequent erosion, it now ranges from 250 to 500 feet at the Arsenal (May 1982). It was derived predominately from the erosion of andesitic and basaltic rocks and was deposited in fluvial environments, and as lacustrine deposits on an extensive piedmont plain (Romero 1976).

Materials in the Denver Formation include olive-gray, brown, and green-gray interbedded claystone, siltstone, sandstone, conglomerate, carbonaceous clay shale, low-grade coal, and lignite. Volcaniclastic material is also present in the Denver Formation and consists of angular to subangular lithic fragments and minerals in a fine-grained clay matrix. The clay matrix is bentonitic and is probably the weathering product of volcanic ash (May 1982).

Individual aquifers within the Denver Formation range in thickness from several inches up to 60 feet. They are generally discontinuous, lenticular, and consist of poorly cemented, medium- to fine-grained sandstone, which grade vertically and laterally into siltstone and clay shale (May 1982).

### A.1.2 Quaternary Deposits

Unconsolidated sediments of Quaternary age unconformably overlie the Denver Formation at the Arsenal. There are, however, a few locations where bedrock is exposed at the surface near topographic highs. The upper surface of the Denver Formation is a paleotopographic or erosional surface that was incised by ancient stream channels. These paleochannels were filled by unconsolidated surficial deposits (Costa 1982). The surficial deposits, previously referred to as Quaternary alluvium or the alluvial aquifer, are up to 130 feet thick and consist of alluvium, loess, and eolian deposits.

### A.1.3 Alluvium

The alluvial deposits are generally composed of yellowish-brown to very pale orange clays, silts, sands, gravels, and boulders. Coarser alluvial material is found in the paleochannels (May 1982). The alluvium is generally unconsolidated except where calcium carbonate has cemented sand and gravel into a conglomerate. The grain size of the alluvial material ranges from clay size to boulders. The sands are subangular to subrounded quartz with mica, heavy minerals, and chert. According to the Unified Soil Classification System, they are predominately SM (sand-silt mixtures) and SP (poorly graded sands) and often contain gravel. The sands are lenticular and grade laterally and vertically into clay, silt, and gravel (May 1982).

### A.1.4 Loess/Eolian Deposits

Loess and other eolian deposits of Pleistocene and Holocene age are widely distributed at the RMA. The loess is generally less than 10 feet thick but may be up to 20 feet thick in the eastern part of the area. It consists of yellowish-brown to light grayish-brown sandy silt and may contain large amounts of clay. The other eolian

deposits are generally 10 to 20 feet thick but may be as much as 40 to 50 feet thick. They consist of light-brown fine sand, sandy silt, and clay (Lindvall 1980).

## **A.2 REGIONAL HYDROLOGY**

The Rocky Mountain Arsenal lies within the South Platte River drainage basin. The river is located several miles to the west and northwest of the Arsenal.

Several tributary drainages flow northwest across the Arsenal to the South Platte River. Groundwater at the Arsenal occurs in the Quaternary surficial deposits and in several bedrock aquifers. The aquifers of primary concern at the Rocky Mountain Arsenal, however, are the Quaternary deposits and portions of the underlying Denver Formation. The deeper bedrock aquifers are separated from the Denver Formation by 50 to 100 feet of shale called a "buffer zone," which acts as an aquitard (Romero 1976).

Groundwater at the Rocky Mountain Arsenal generally flows from the southeast to the northwest and eventually discharges into the South Platte River. However, there are local variations in flow direction (May 1982) believed to be caused by local bedrock paleotopography and the groundwater mound that exists beneath the South Plants area (May 1982). Groundwater in the unconsolidated Quaternary alluvial aquifer is found under unconfined conditions. Groundwater in the Denver Formation is found under both unconfined and confined flow conditions at the Arsenal depending on the degree of weathering and nature of the contact between the alluvial aquifer and the upper Denver Formation. If a Denver Formation sandstone unit subcrops below the saturated alluvium, the base of the subcropping sandstone is considered the base of the unconfined flow system.

The hydraulic conductivity of the two aquifers varies considerably. The hydraulic conductivity of the alluvium has been measured at between  $9.08 \times 10^{-1}$  to  $2.4 \times 10^{-3}$  cm/sec. The lower hydraulic conductivity values were found in the Basin A area. Hydraulic conductivity measured in the Denver Formation yielded values ranging from  $10^{-7}$  cm/sec for clay shales to as high as  $10^{-3}$  cm/sec to  $10^{-4}$  cm/sec for sands (May 1982).

Due to the contrast in hydraulic conductivity between the Denver Formation and the alluvium, groundwater flow and contaminant transport through unfractured bedrock is assumed to be relatively slow compared to flow and transport in either saturated alluvium or in fractures in the Denver Formation (Stollar 1988). Within the alluvial unit, the paleochannels generally have higher hydraulic conductivities than the surrounding alluvial materials due to the coarser materials in the paleochannels. These channels appear to serve as conduits that move alluvial groundwater at higher rates and volumes than in other parts of the unconfined system (May 1982). The primary

groundwater flow components at the Arsenal generally follow the paleochannels in the alluvium; however, flow is not restricted to only the paleochannels. A great deal of groundwater flow occurs over channel divides and through the Denver Formation (May 1982).

### **A.3 M-1 BASINS SITE GEOLOGY**

The M-1 Basins are located on a paleotopographic high near the headwaters of a series of paleodrainages that originate in the upland area occupied by Section 1.0. Two significant stratigraphic units have been identified at the site. These are the Quaternary Alluvium and the Cretaceous-Tertiary Denver Formation.

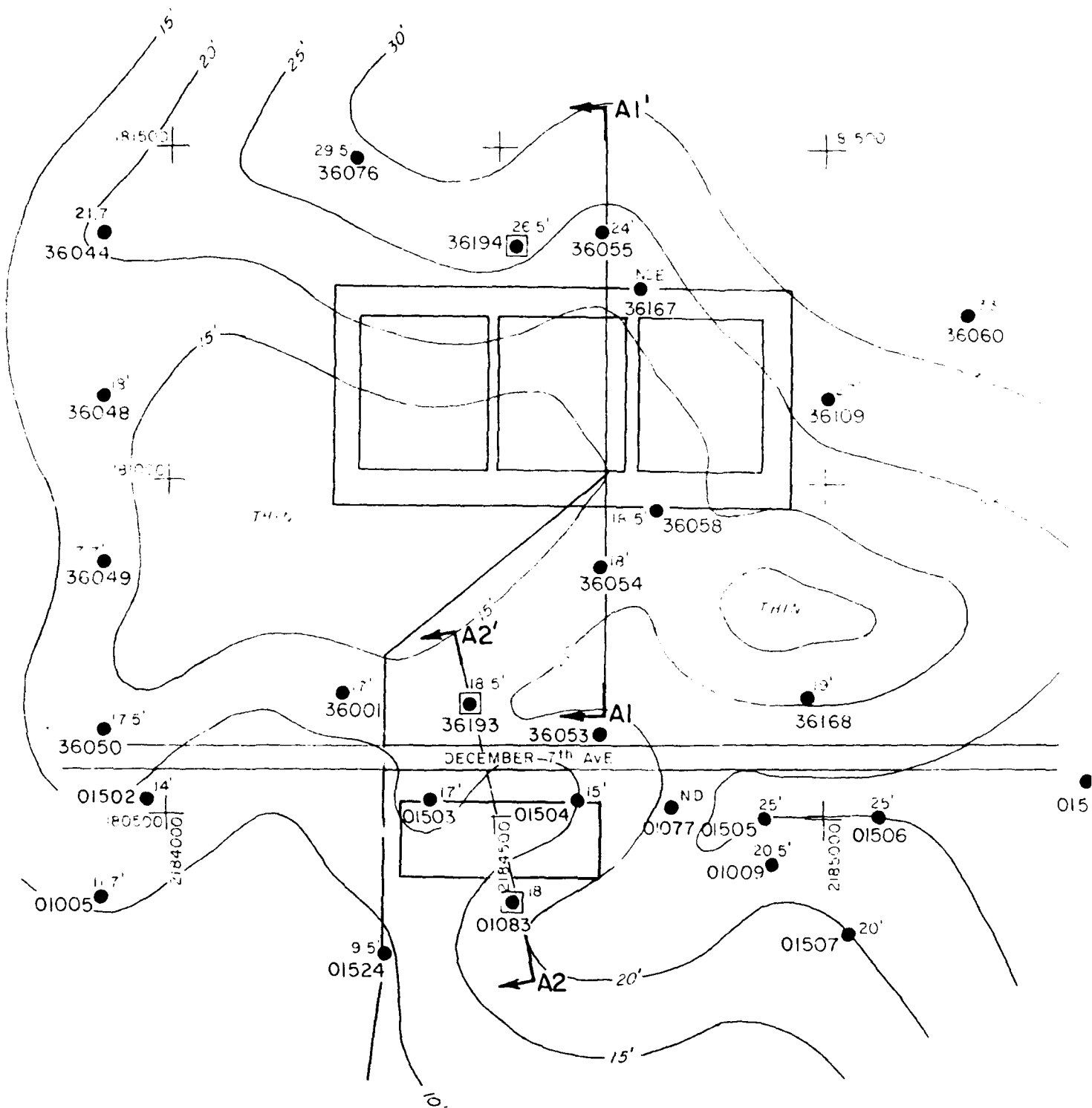
The surficial materials in the M-1 Basins are 10 to 20 feet thick and unconformably overlie the Denver Formation. The entire area around the basins is covered with a veneer of imported soil. The soil cover over the waste material in the basins ranged from 2 to 4 feet thick. Figure A-1 is an alluvial isopach map of the M-1 Settling Basins and Lime Settling Basins areas. Figure A-2 is a geologic cross-section of the M-1 Settling Basins area.

The unconsolidated alluvial material is composed of yellowish-brown to grayish-brown, fine-grained to medium-grained, sub-angular, alluvial, eolian, and alluvial sands, silts, and clays, with some minor amounts of gravel.

The Denver Formation, to the depth penetrated, is composed of weathered, dark to dusky brown, hard dense, blocky claystone interbedded with medium gray, hard, sandy to gravelly siltstone and lignite. The contact between the alluvial unit and the Denver Formation is generally characterized by a claystone; however, it may also be marked by siltstone or lignite. The elevation of the contact between the alluvial soil and the top of the Denver Formation is variable at RMA. In the M-1 Basins area, the contact was found between an elevation of approximately 5,246 feet and 5,254 feet above MSL. Figure A-3 is a contour map of the top of the Denver Formation.

#### **A.3.1 Site Hydrology**

Both the alluvial and bedrock units are known to be water-bearing units in the M-1 Basins area. Previous investigations conducted at RMA have concluded that the alluvial aquifer is unconfined and that the Denver Formation may be partially confined in some zones beyond the upper weathered zone (Ebasco Services, Inc. 1989a). The weathered portion of the Denver Formation is apparently in contact with the alluvial aquifer. Since










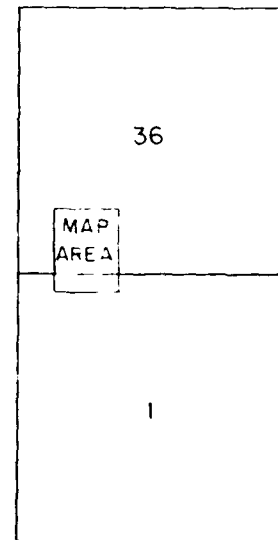
0 100 200 400

SCALE IN FEET

CONTOUR INTERVAL = 5'

### LEGEND

-  30" PIPELINE
-  MONITORING WELL LOCATION
-  NEW MONITORING WELL LOCATION
- ND NO DATA
- NDE NOT DEEP ENOUGH
-  STATE PLANAR COORDINATES
-  ISOPACH LINE



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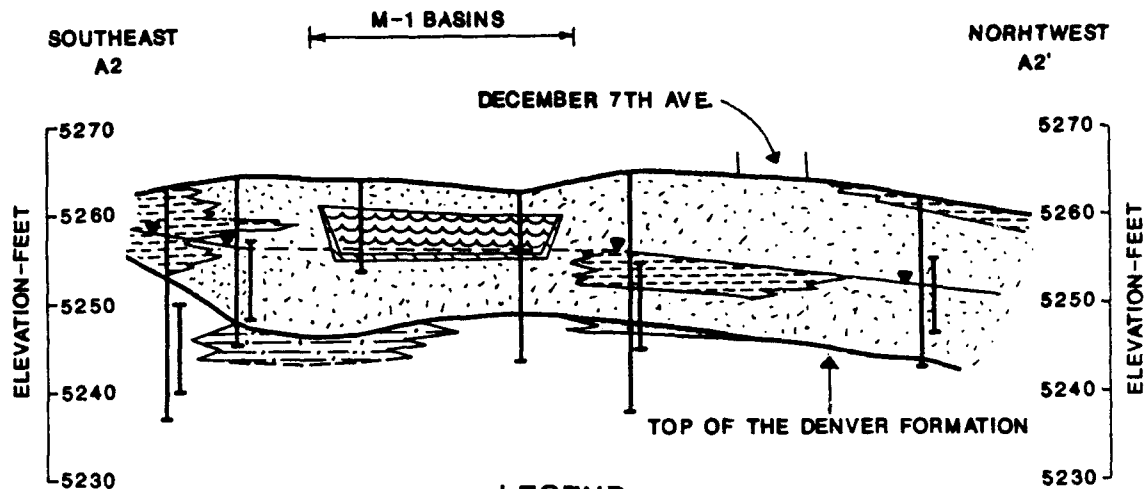
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Date: 7/26/89

M-1 SETTLING BASINS AND  
LIME SETTLING BASINS AREA  
ALLUVIAL ISOPACH MAP  
Figure A-1

01524 01083  
(209')WCC-7  
(7')WCC-6  
(89')01503  
(95')

36193

**LEGEND****ALLUVIUM**

- WASTE
- SOIL-WASTE MIXTURE
- INORGANIC CLAYS LOW TO MEDIUM PLASTICITY
- SILTY SANDS AND INORGANIC SILTS (SM, ML)

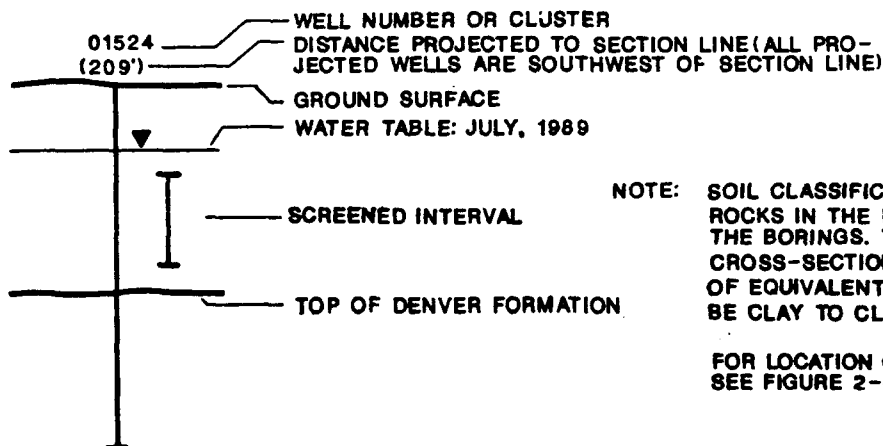
**DENVER FORMATION**

- SILTSTONE
- CLAYSTONE, SHALE
- LIGNITE

4X VERTICAL EXAGGERATION

0 20 40 80  
HORIZONTAL

0 5 10 20  
VERTICAL  
SCALE IN FEET



NOTE: SOIL CLASSIFICATIONS WERE USED TO DESCRIBE ROCKS IN THE DENVER FORMATION IN SOME OF THE BORINGS. THESE WERE CHANGED ON THE CROSS-SECTION TO SHOW CONSOLIDATED ROCKS OF EQUIVALENT GRAIN SIZE. AN EXAMPLE WOULD BE CLAY TO CLAYSTONE OR SHALE.

FOR LOCATION OF CROSS-SECTION A2-A2'  
SEE FIGURE 2-4

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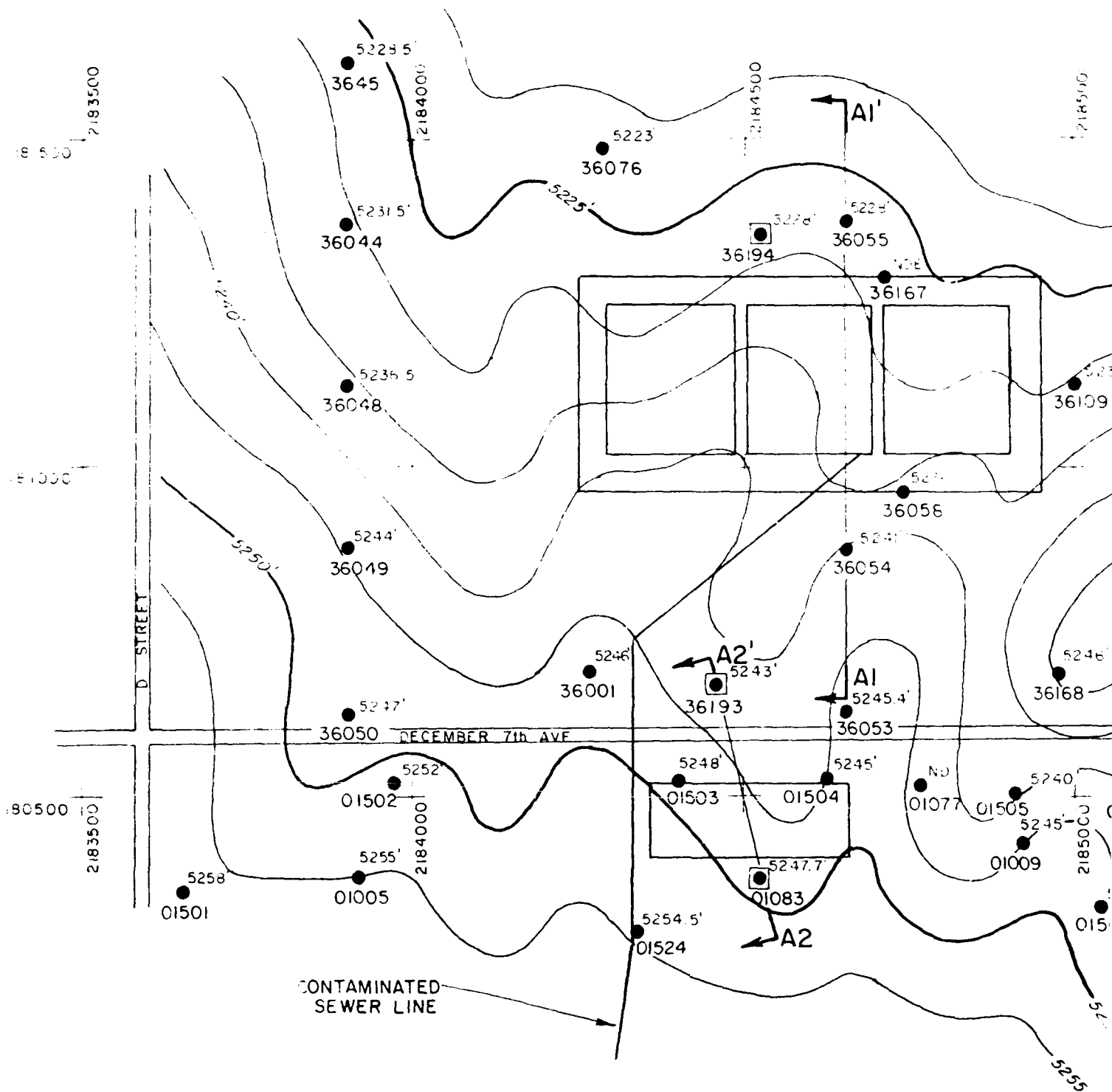
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M-1 BASINS

GEOLOGIC CROSS-SECTION A2-A2'

Figure A-2







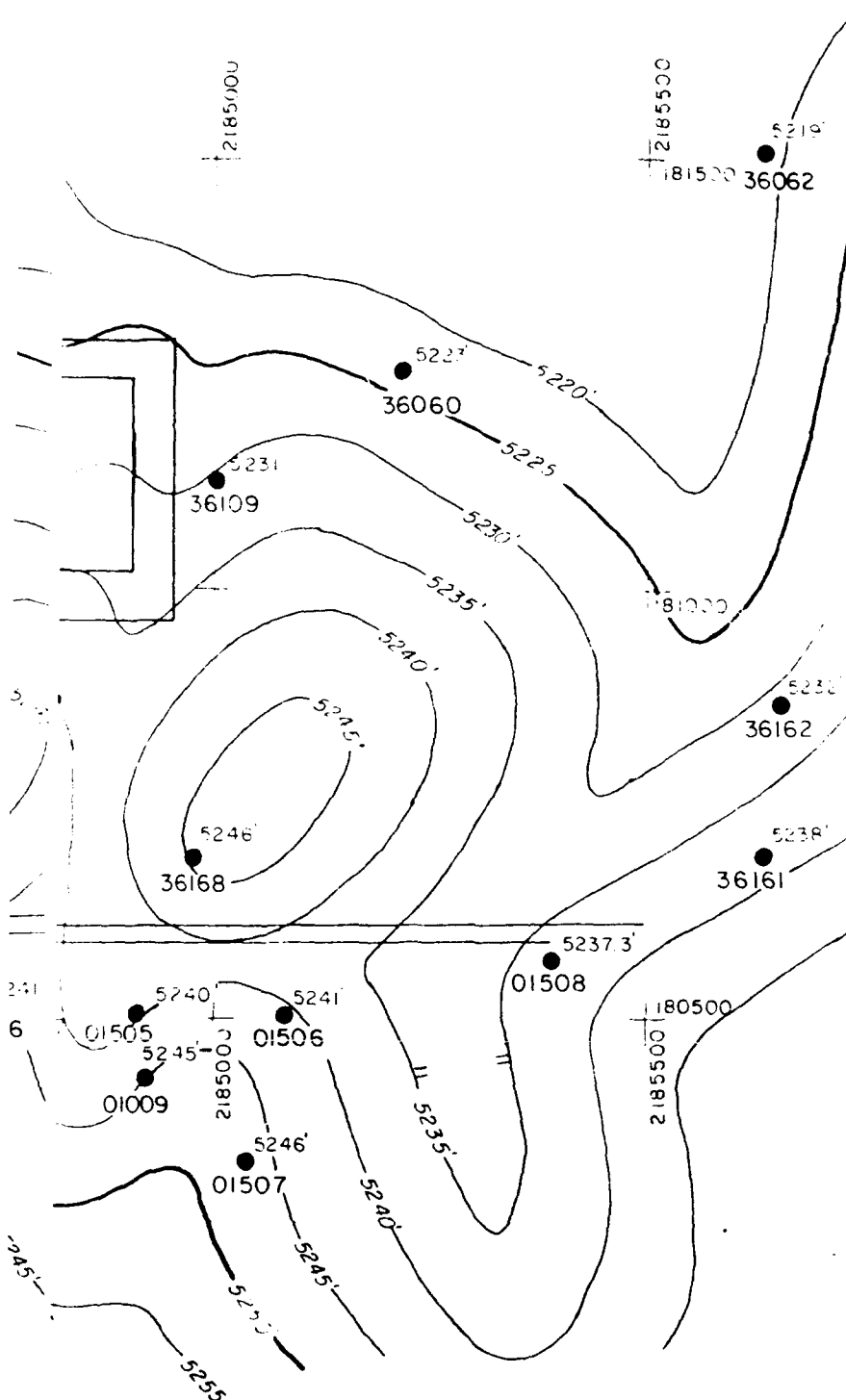
0 100 200 400

SCALE IN FEET

CONTOUR INTERVAL = 5'

**LEGEND**

- 30" PIPELINE
- MONITORING WELL LOCATION
- NEW MONITORING WELL LOCATION
- NOT DEEP ENOUGH
- NO DATA
- CONTOUR SHOWING ELEVATION OF TOP OF DENVER FORMATION IN FEET ABOVE MEAN SEA LEVEL
- STATE PLANAR COORDINATES



Job No. : 22238

Prepared by: R L.C.

Date: 7/28/89

**M-1 AND LIME SETTLING BASINS AREA**  
 ELEVATION OF THE DENVER  
 FORMATION  
 Figure A-3

this investigation focused primarily on evaluating impacts to the alluvial aquifer, the discussion will be limited to the characteristics of the unconfined alluvial aquifer.

In the M-1 Basins area, groundwater flow in the alluvial aquifer is apparently toward the north and possibly slightly northwest due to the influence of localized mounding of groundwater and paleotopographic influences in the South Plants area. The local groundwater gradient is in the range of 0.008 to 0.011 ft/ft. Due to seasonal variations and local topography, the top of the groundwater ranges from approximately 5 to 10 feet below ground surface. The average saturated thickness of the alluvial aquifer ranged from 6 feet to approximately 15 feet in the M-1 Basins area. Figure A-4 is a contour map of the alluvial aquifer potentiometric surface in the M-1 Settling Basins and Lime Settling Basins areas.

#### **A.3.2 Previous Soil Investigations**

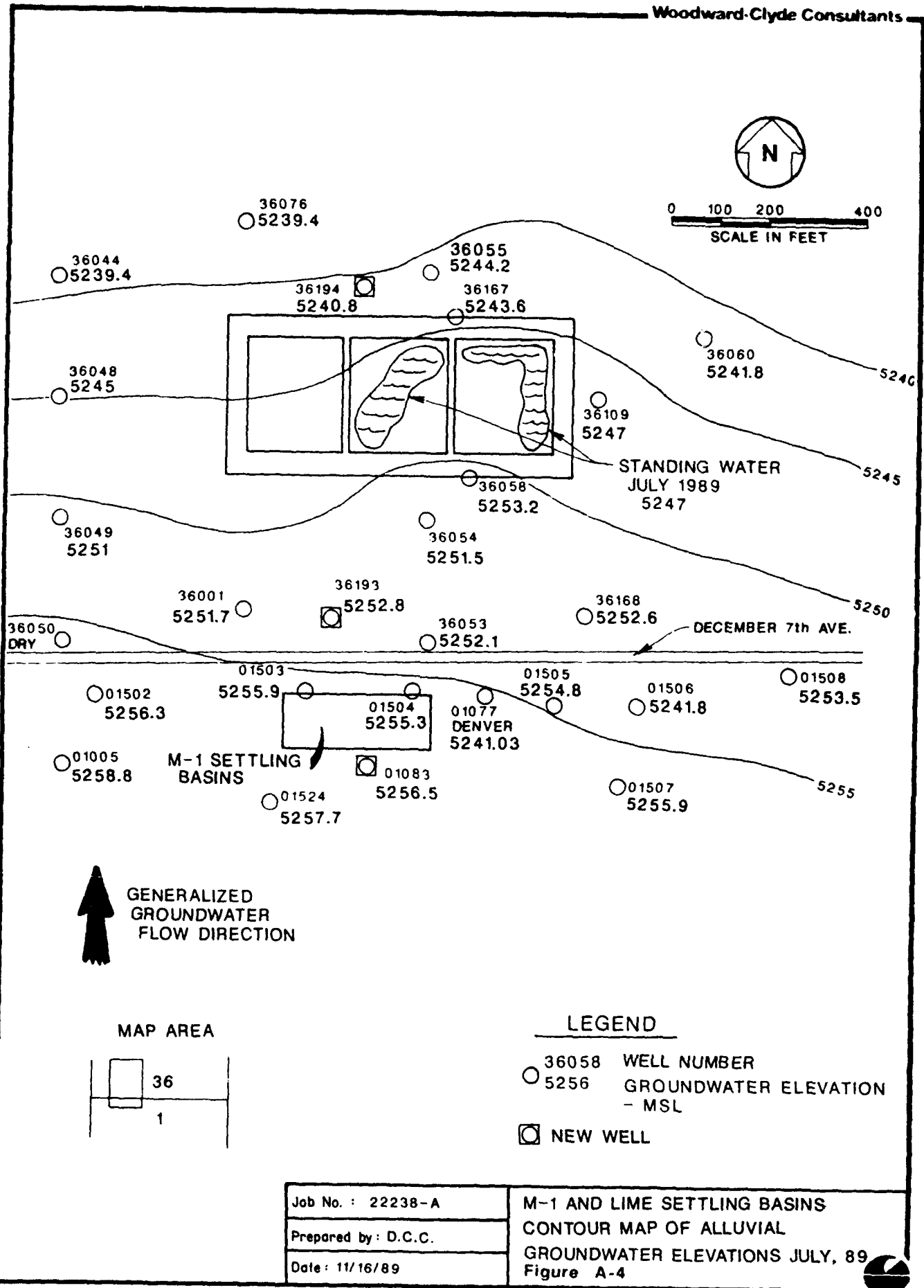
The M-1 Settling Basins were investigated by the Army's consultant, Ebasco, in 1987 and by Shell's consultant, Morrison-Knudsen Engineers (MKE) in 1988. Twenty-six soil and waste samples were taken from six borings within or near the M-1 Settling Basins during the two investigations. The locations of these borings are shown in Figure A-5. The samples were analyzed for volatiles, semivolatiles, ICP metals, arsenic, mercury, and thiodiglycol.

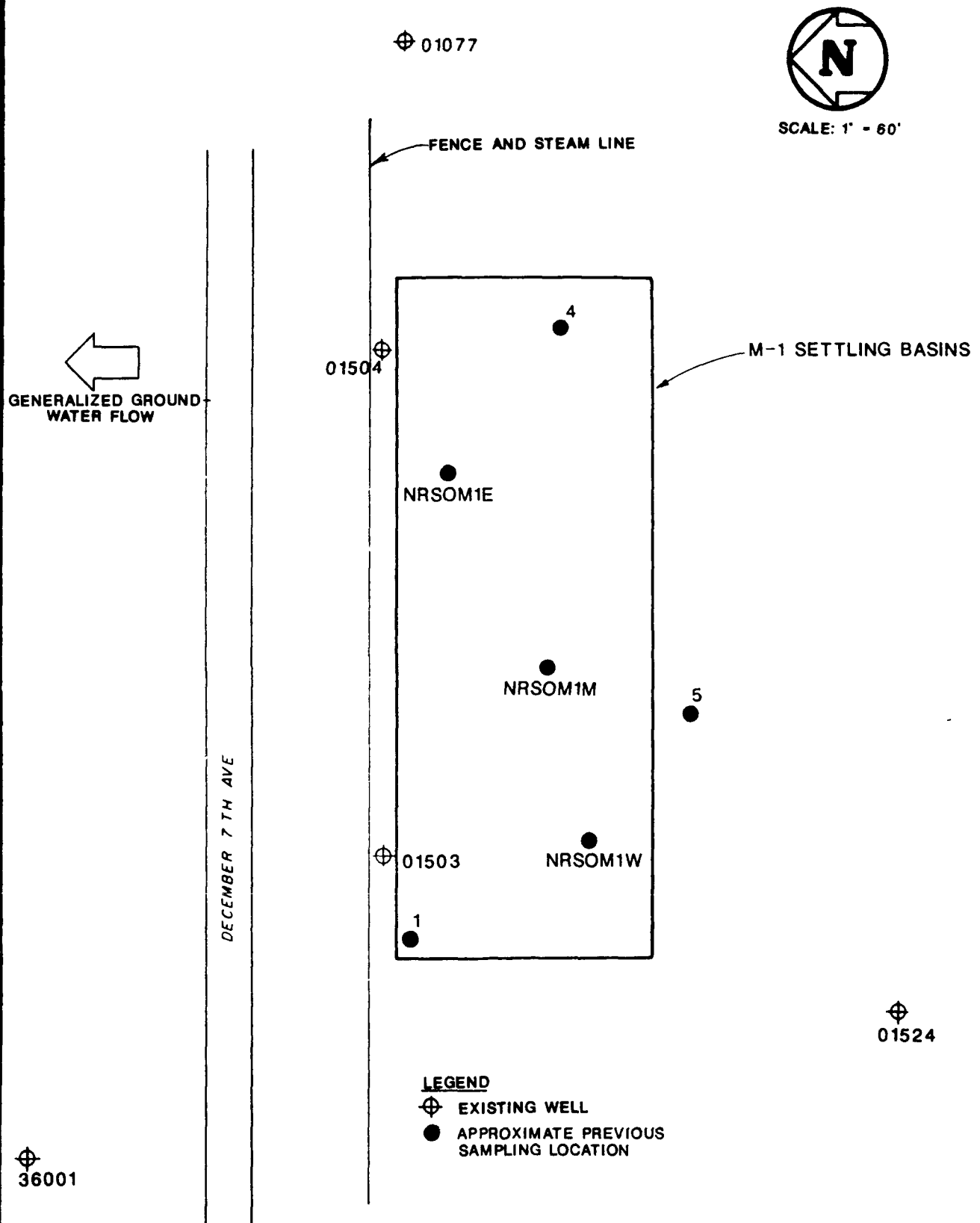
#### **A.3.3 Previous Groundwater Investigations**

Several groundwater monitoring wells have been installed to monitor the alluvial unit in the vicinity of the M-1 Basins. Well Nos. 01503 and 01504 are located in the berm immediately downgradient of the M-1 Basins; Well No. 01524 is located approximately 100 feet upgradient of the western-most basin; Well No. 36001 is located approximately 100 feet northwest (downgradient) of the western-most basin; and Well No. 01077 is located approximately 100 feet east of the basin area. The locations of these wells are shown in Figure A-5. Samples from the wells were analyzed for filtered and non-filtered arsenic and mercury, as well as volatiles, semivolatiles, and pesticides.

#### **A.3.4 Nature and Extent of Soils Contamination**

Soil samples collected and analyzed during the previous investigations indicated high concentrations of arsenic and mercury in the soil in and around the M-1 Basins at depths from 0.5 foot to approximately 7.0 feet. The concentration of arsenic and mercury in samples taken within the basins was variable, ranging from 0.1 to





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M-1 SETTLING BASINS

PREVIOUS SAMPLING PROGRAMS

Figure A-5

11 percent. Concentrations of these constituents are reduced at depths below about 10 feet. Table A-1 shows a summary of the contaminants identified in soil samples taken during the previous studies.

#### **A.3.5 Nature and Extent of Groundwater Contamination**

Groundwater samples collected and analyzed during the previous studies indicate that a high concentration of arsenic in unfiltered groundwater samples downgradient of the M-1 Basins area. Unfiltered water samples from Well Nos. 01503 and 01504 indicate up to 59,000  $\mu\text{g/l}$  arsenic, while the filtered samples indicate 0.01  $\mu\text{g/l}$  for each well. However, the findings of the field program presented in Section 4.0 of this report indicate that most of the arsenic detected in downgradient wells passed through a 0.45 micron filter. Water samples from wells located upgradient and adjacent to the basins did not indicate elevated concentrations of either filtered or nonfiltered arsenic or mercury. Table A-2 shows a summary of the contaminants identified in water from wells in the M-1 Basins area during previous studies.

#### **A.4 36-17 TRENCHES SITE GEOLOGY**

Site 36-17N lies in an upland area of RMA along the west flank of a prominent ridge that forms the eastern boundary of Basin A. The Site 36-17 trenches are located along the west flank of the bedrock ridge although some of the disposal trenches in Anomoly C may straddle the crest of the ridge. There are two stratigraphic units of interest beneath Site 36-17: the Quaternary Alluvium and the Denver Formation.

The Quaternary Alluvium is composed of fine-grained, medium-grained, and coarse-grained alluvium on the basis of the Unified Soil Classification System (USCS) scheme. In general, the fine-grained material corresponds to alluvial clay horizons, medium-grained material to eolian sand and silts, and coarse-grained material to fluvial sands and gravels of the Verdos and Piney Creek Alluvium.

In Site 36-17 the most prominent member of the alluvial unit is the medium-grained eolian sand and loess, which ranges from about 5 to 30 feet thick. It consists of interbedded tan to yellowish-brown, grayish-brown, reddish-brown, black, silty sand, clayey silt, silt, clay, and sand. Typically, a clay-rich alluvial unit is found above the contact between the Alluvium and the underlying Denver Formation bedrock. Figure A-6 is an alluvial isopach map of the Site 36-17 trench disposal area.

The other significant stratigraphic unit in the study area is the Cretaceous-Tertiary Denver Formation, which represents bedrock. Regionally, the bedrock surface of the Denver Formation slopes to northwest. However,

**TABLE A-1**  
**SUMMARY OF CONTAMINANTS (HISTORICAL DATA) IDENTIFIED IN**  
**SOIL BORINGS IN M-1 SETTLING BASINS AREA**

Soil Contaminant	Highest Concentration Encountered in any of the Borings	Boring No.	Sample Depth (ft)
<u>Volatiles (µg/g)</u>			
Bicycloheptadiene	600	5	9-10
Dicyclopentadiene	4,000	5	4-5
<u>Semivolatiles (µg/g)</u>			
Aldrin	80	5	0-1
Dicyclopentadiene	400	5	4-5
Dieldrin	100	5	0-1
Hexachlorocyclopentadiene	3,000	4	0-1
Isodrin	10	5	0-1
<u>ICP Metals (µg/g)</u>			
Cadmium	3,900	1	2-3
Chromium	23	1	10.7-11.7
Copper	21	5	0-1
Lead	64	1	2-3
Zinc	76	5	4-5
<u>Arsenic (µg/g)</u>	110,000	4	4-5
<u>Mercury (µg/g)</u>	54,000	MKE No. NRSO1M1E	5
<u>Thiodiglycol (µg/g)</u>	None detected		

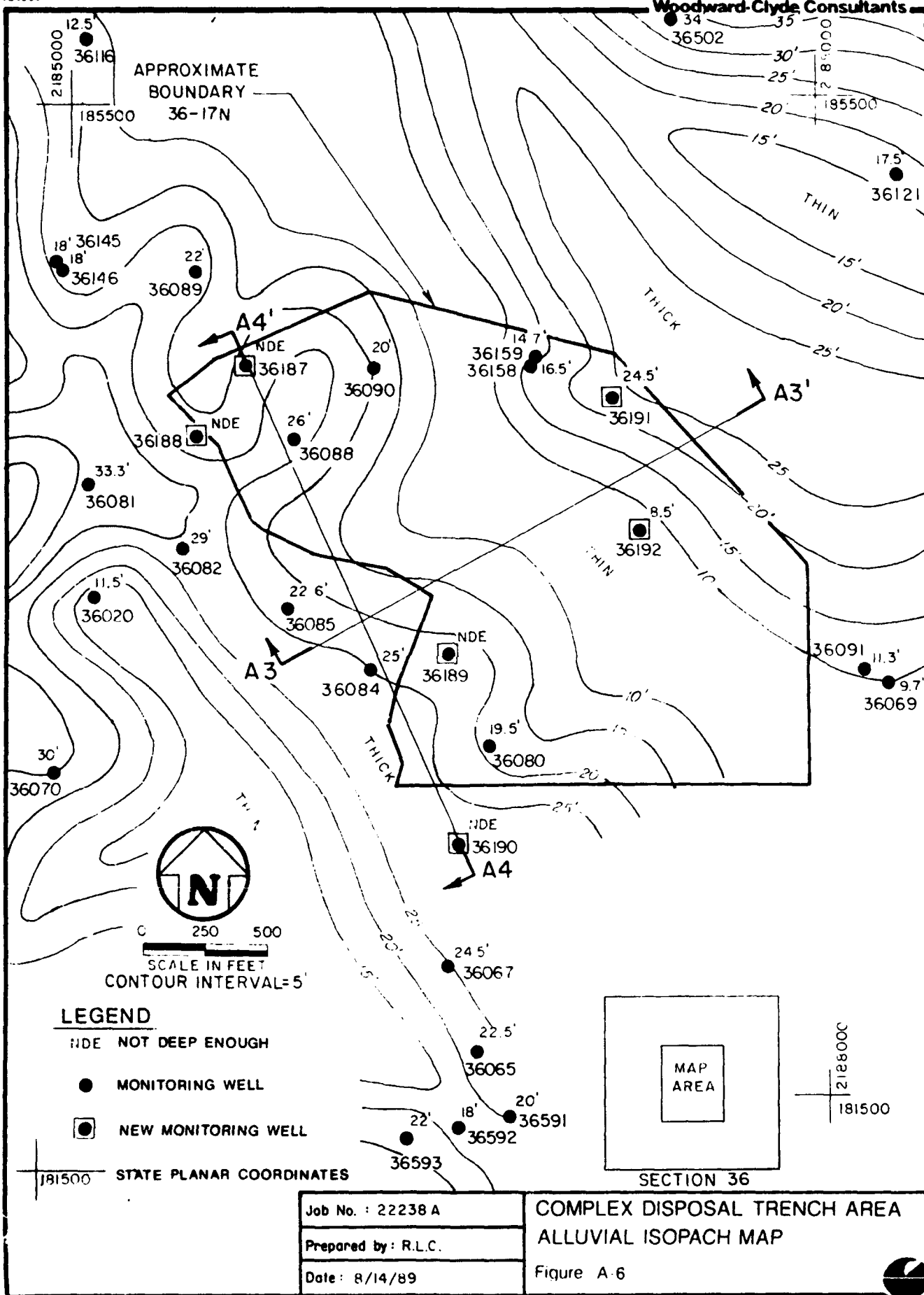
Note: This data is from all available data as of 11/89.

**TABLE A-2**  
**SUMMARY OF CONTAMINANTS (HISTORICAL DATA) IDENTIFIED IN**  
**MONITORING WELLS IN M-1 SETTLING BASINS AREA**

Substances Analyzed in Groundwater Samples	Well No.			
	01502	01503	01504	01506
Dicyclopentadiene	<10 (1979)	2,319 (1979)	34,470 (1979)	173 (1979)
Bicycloheptadiene	84 (1979)	7,438 (1983)	2,379 (1983)	ND
Dieldrin	1.42 (1979)	1.26 (1983)	1.42 (1979)	1.27 (1979)
Aldrin	<0.2 (1979)	1.58 (1983)	0.75 (1979)	1.59 (1983)
Isodrin	<0.2 (1983)	2 (1983)	2 (1983)	0.47 (1983)
Arsenic (filtered)	<0.050 (1979)	0.01 (1979)	0.01 (1979)	0.07 (1979)
Total arsenic	<50 (1979)	23,400 (1979)	59,300 (1979)	<50 (1979)
DBCP	5.06 (1979)	<10 (1979)	<10 (1979)	16 (1979)
Mercury	<1.0 (1979)	<1.0 (1979)	29 (1979)	<1.0 (1979)
Tetrachloroethylene	1,000 (1988)	630 (1979)	28 (1979)	23 (1979)
Trichloroethylene	800 (1988)	210 (1979)	4 (1983)	5,000 (1988)

Note: all values in  $\mu\text{g/l}$





at Site 36-17, the bedrock surface slopes to west-southwest into Basin A. Figures A-7 and A-8 are geologic cross-sections through the Site 36-17 trench disposal area. Figure A-9 is a contour map of the top of the Denver Formation.

The Denver Formation to the maximum depth penetrated consists predominately of medium to dark brown, reddish-brown, grayish-brown, and greenish-gray, hard, blocky shale and claystone with interbedded lenses of sandy to gravely siltstone, tan to yellowish-brown fine to coarse grained, well cemented sandstone, and a stiff, tan, volcanoclastic unit at the top of the Denver Formation.

Before and during the deposition of the alluvial material, an ancient stream system eroded the surface of the Denver Formation. As a result, the contact between the two stratigraphic units is highly irregular and in Site 36-17 is often marked by the volcanoclastic unit of the Denver Formation. The volcanoclastic unit caps the prominent northwest trending bedrock ridge that traverses the area.

Significant features of the volcanoclastic unit include:

- Zones of iron oxide enrichment from weathering of volcanic glass and mafic materials (may retard metals migration)
- Local zones of poorly defined fracturing, with or without limonic encrustations (may affect groundwater flow)
- Presence of large volcanic fragments characterize the area
- The unit is resistant to erosion

Within Site 36-17, only two Denver Formation units have been confirmed to subcrop. These are a claystone/shale unit and the volcanoclastic unit.

### A.4.1 36-17 Trenches Site Hydrology

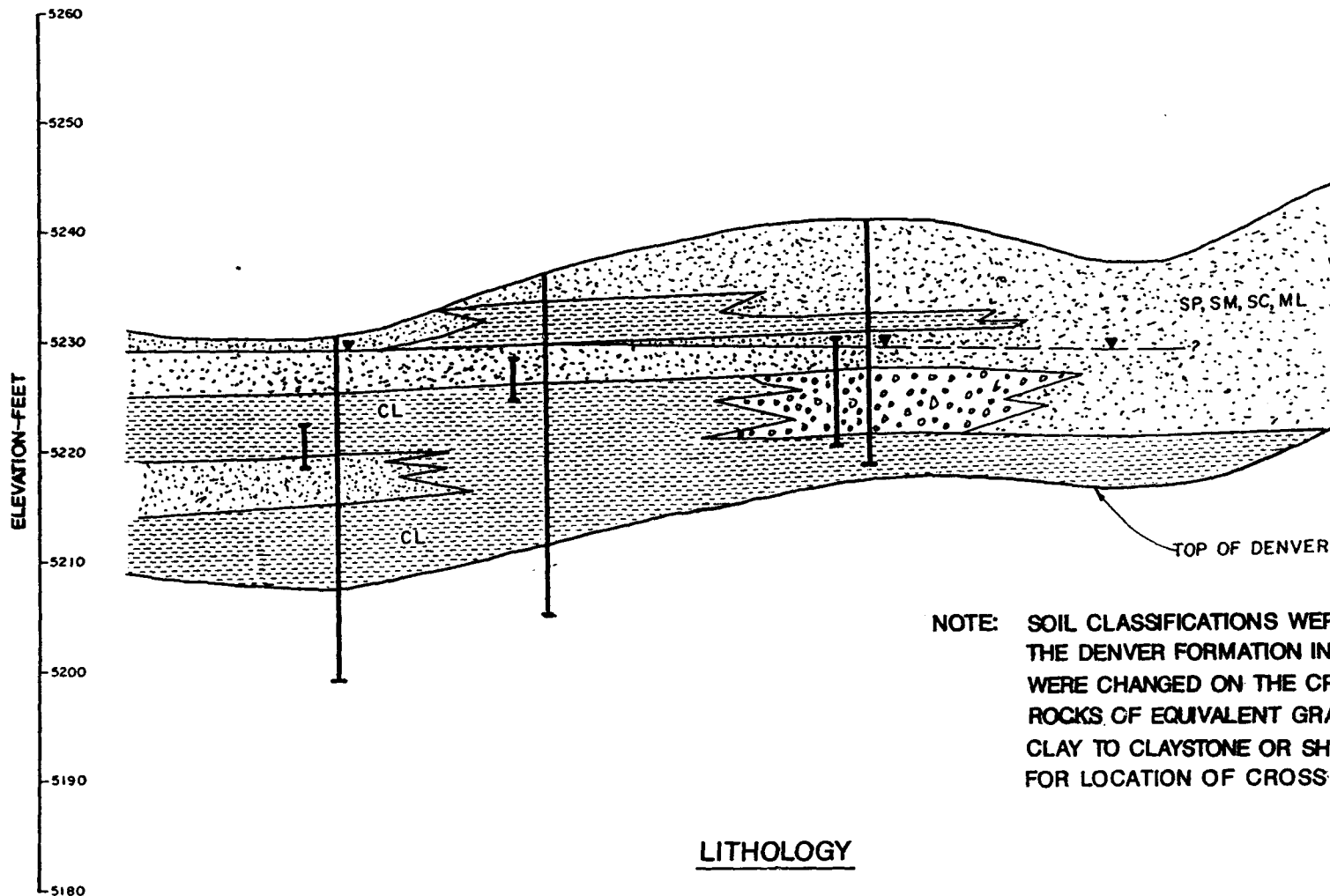
The discussion in this section addresses the hydrologic system in Site 36-17 and how it relates to evaluating the need for an IRA on the disposal trenches. Portions of the text have been excerpted from the CSAR (Ebasco 1989). A more detailed discussion of the hydrology of the CSA is contained in that report.

36085  
(+190')

36084  
(-180')

36189  
(-275')

SOUTHWEST  
A3



## LITHOLOGY

### ALLUVIUM

- SILTY GRAVELS, CLAYEY GRAVELS (GM, GC)
- SANDS, SILTY SANDS, CLAYEY SANDS AND INORGANIC SILTS (SP, SM, SC, ML)
- INORGANIC SILTY SANDY CLAYS OF LOW TO MEDIUM PLASTICITY (CL)

### DENVER FORMATION

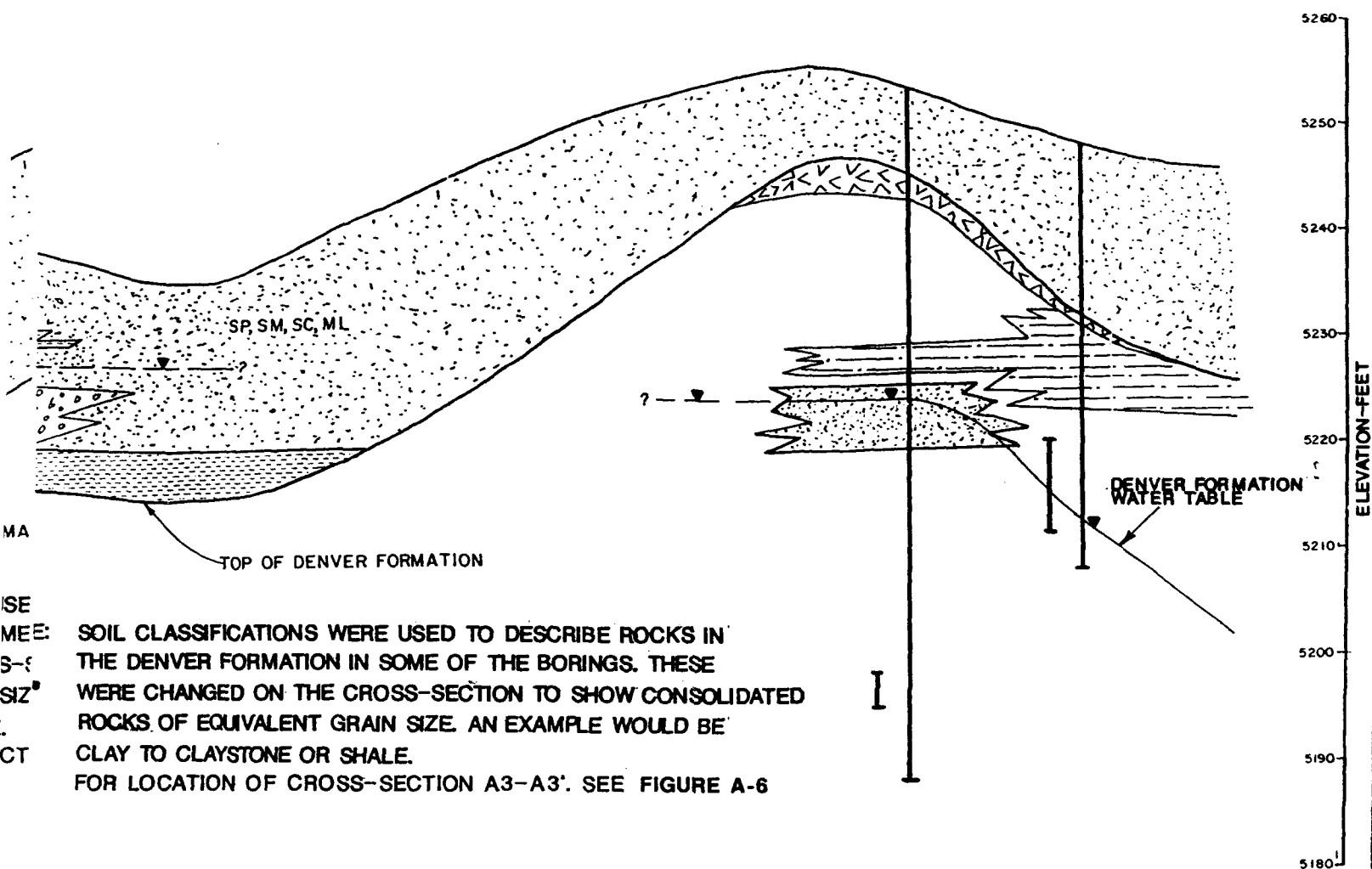
- SANDSTONE, FINE TO COARSE GRAINED, WELL CEMENTED, VERY DENSE
- SILTSTONE, SANDY, TRACE OF FINE GRAVEL, FIRM TO SOFT, DENSE
- VOLCANICLASTICS, TAN CLAY WITH BROWN, GREEN AND BLACK MINERAL FRAGMENTS
- CLAYSTONE, SHALE, BROWN TO GRAY, OCCASIONALLY SILTY AND/OR SANDY, HARD DENSE

36085 ——— WELL NUMBER  
(+190') ——— SECTION  
——— (SOUTH)  
——— GROUND  
——— ALLUVIAL  
——— DASHED  
——— SCREENED  
——— TOP OF

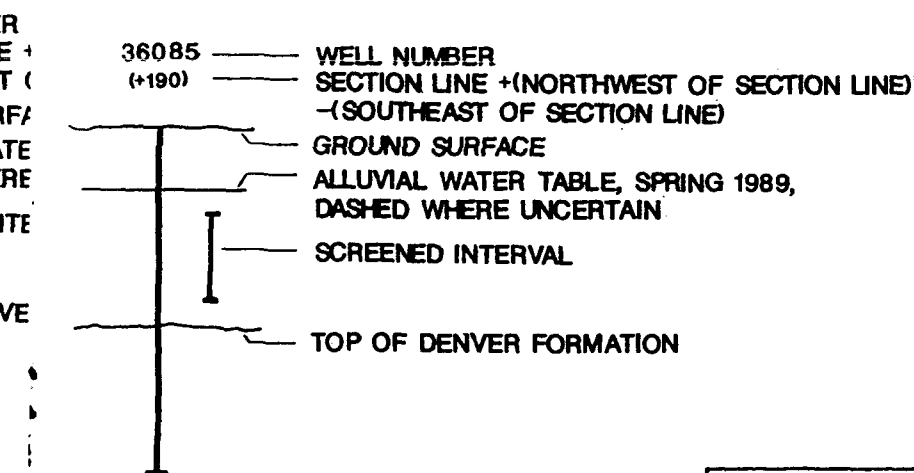
36192  
(-220)

36191  
(+290)

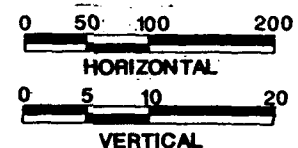
NORTHEAST  
A3'



SOIL CLASSIFICATIONS WERE USED TO DESCRIBE ROCKS IN THE DENVER FORMATION IN SOME OF THE BORINGS. THESE WERE CHANGED ON THE CROSS-SECTION TO SHOW CONSOLIDATED ROCKS OF EQUIVALENT GRAIN SIZE. AN EXAMPLE WOULD BE CLAY TO CLAYSTONE OR SHALE.  
FOR LOCATION OF CROSS-SECTION A3-A3'. SEE FIGURE A-6

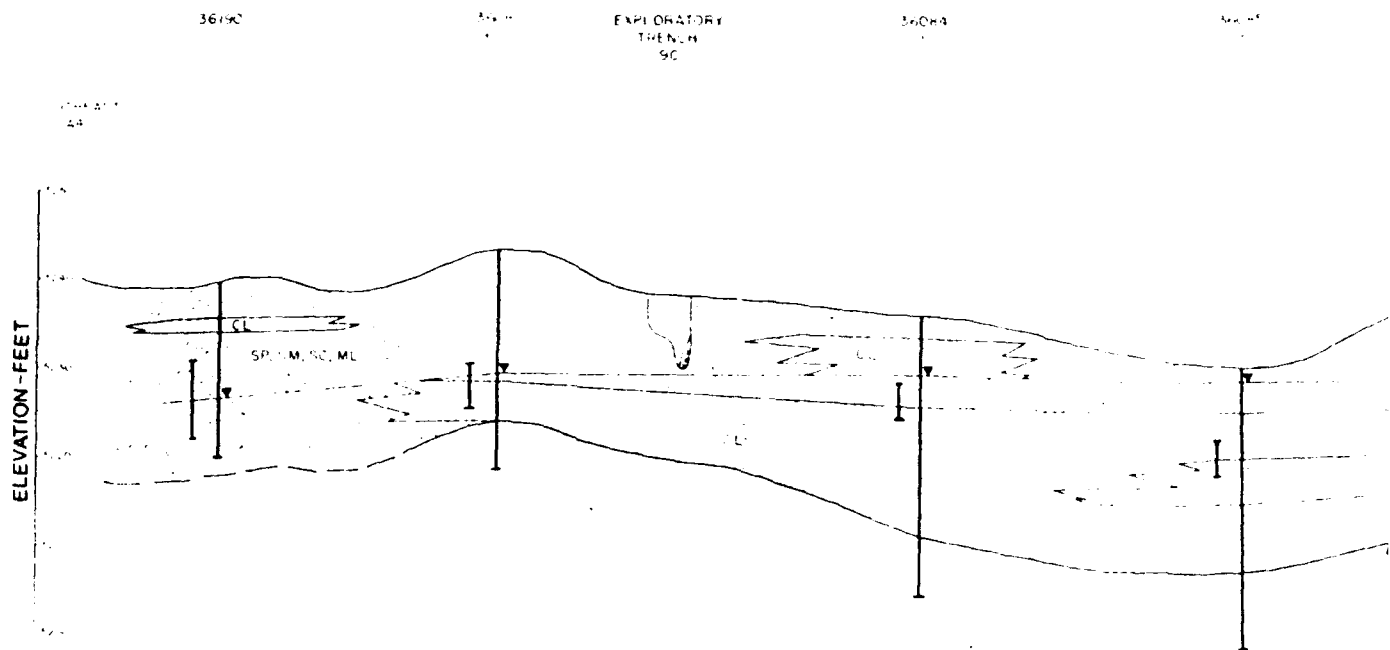


10 X VERTICAL EXAGGERATION



SCALE IN FEET

Job No. : 22238	COMPLEX DISPOSAL TRENCH AREA GEOLOGIC CROSS-SECTION A3-A3' Figure A-7
Prepared by : R.C.L.	
Date : 8/15/89	



### LEGEND



EXPLORATORY TRENCH, DISPOSAL TRENCH IS PERPENDICULAR TO SECTION LINE

#### ALLUVIUM



SANDS, SILTY SANDS, CLAYEY SANDS AND INORGANIC SILTS (SP, SM, SC, ML)



INORGANIC SILTY SANDY CLAYS OF LOW TO MEDIUM PLASTICITY (CL)



INORGANIC CLAYS OF HIGH PLASTICITY (CH)



DEBRIS MATERIAL FOUND IN TRENCH CONSISTING OF WOOD, BURNED WOOD, METAL AND EMPTY BOTTLES

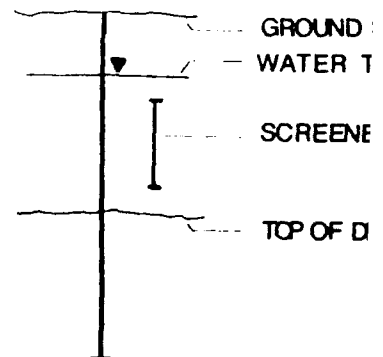
#### DENVER FORMATION

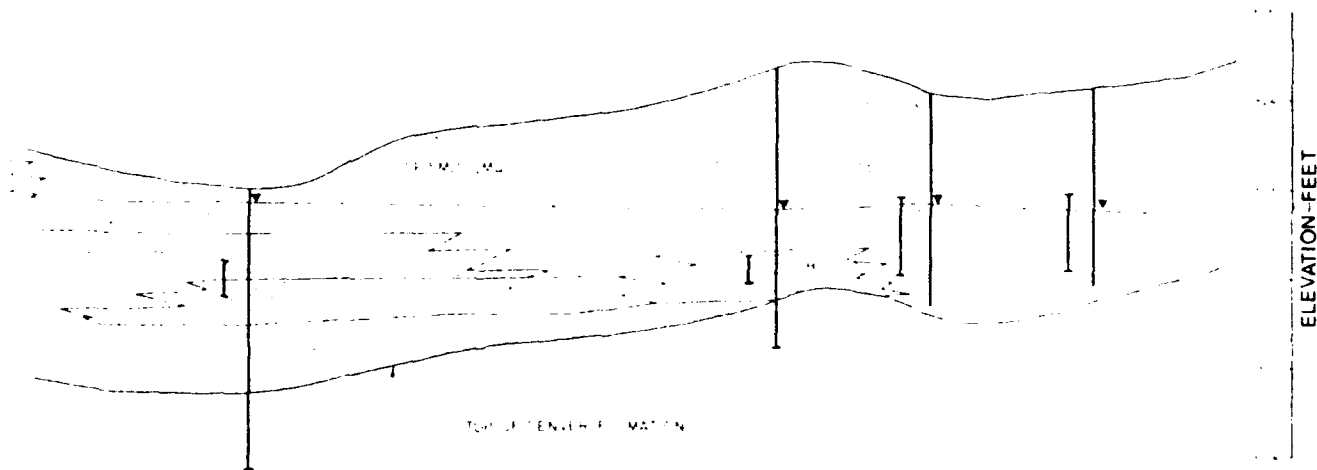


CLAYSTONE, SHALE, BROWN TO GRAY OCCASIONALLY SILTY AND/OR SANDY, HARD DENSE

36080 ----- WELL NUMBER

(+270') ----- DISTANCE  
+ (NORTH)  
- (SOUTH)





CLASSIFICATIONS WERE USED TO DESCRIBE ROCKS IN  
 DENVER FORMATION IN SOME OF THE BORINGS. THESE  
 CHANGED ON THE CROSS-SECTION TO SHOW  
 SOLIDATED ROCKS OF EQUIVALENT GRAIN SIZE.  
 SAMPLE WOULD BE CLAY TO CLAYSTONE OR SHALE.  
 LOCATION OF CROSS-SECTION A4-A4'. SEE FIGURE A-6

36080 --- WELL NUMBER  
 (+270') --- DISTANCE PROJECTED TO SECTION LINE  
 + (NORTHWEST OF SECTION LINE)  
 - (SOUTHWEST OF SECTION LINE)

GROUND SURFACE  
 WATER TABLE, SPRING 1989  
 SCREENED INTERVAL  
 TOP OF DENVER FORMATION

10X VERTICAL EXAGGERATION

0 50 100 200  
 HORIZONTAL

0 5 10 20  
 VERTICAL

SCALE IN FEET

Job No. : 22238

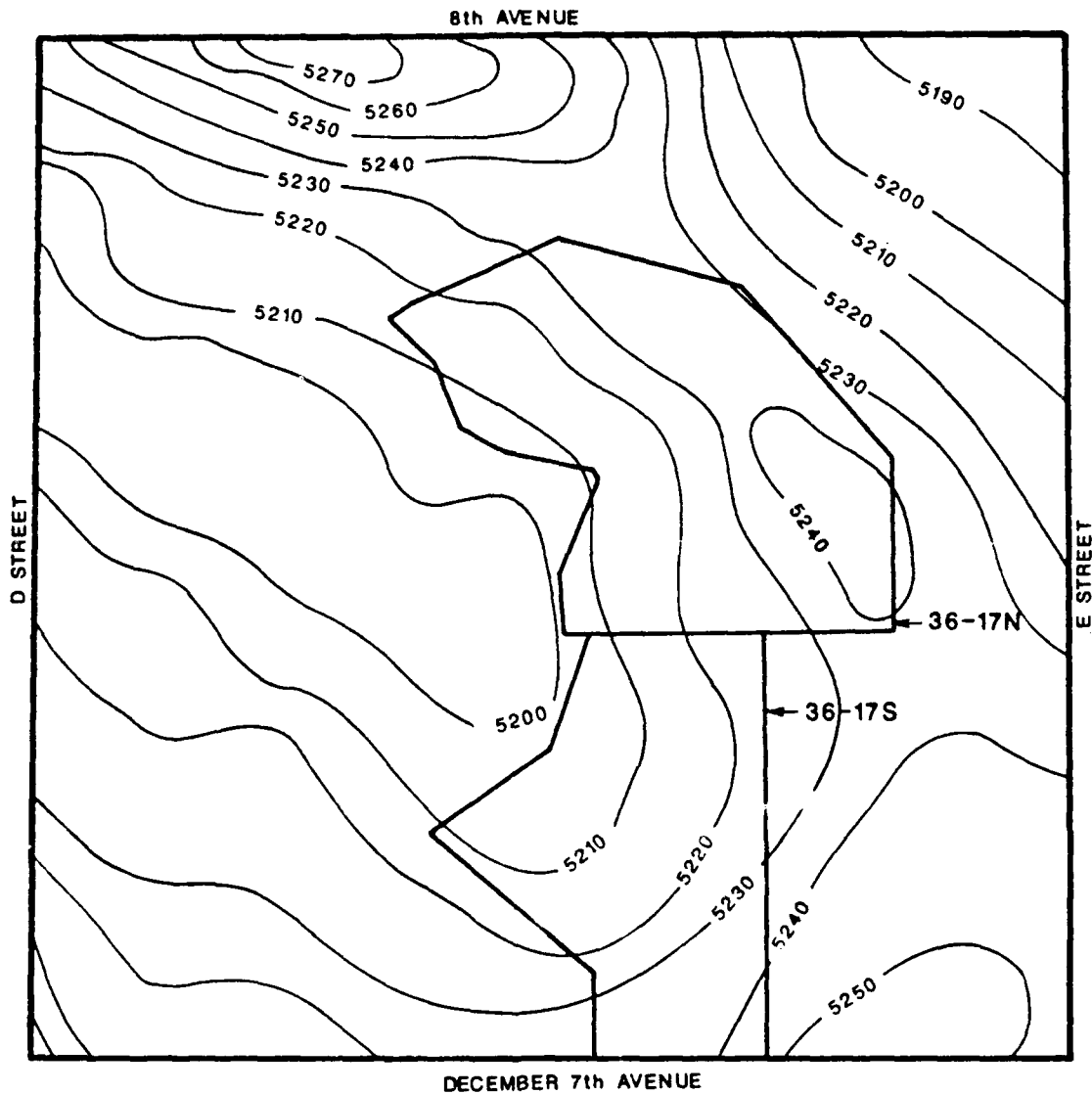
Prepared by : R.C.L.

Date : 8/15/89

COMPLEX DISPOSAL TRENCH AREA

GEOLOGIC CROSS-SECTION A4-A4'

Figure A-8



0 450 900 1800  
SCALE IN FEET

NOTE: ELEVATIONS REFLECT FEET  
ABOVE MEAN SEA LEVEL

Job No. : 22238-A

Prepared by: R.C.C.

Date: 11/16/89

SECTION 36

ELEVATION OF THE DENVER FORMATION

Figure A-9

The hydrologic regime in Site 36-17 is affected by four major components: (1) surface water, (2) vadose zone, (3) alluvial aquifer/unconfined weathered Denver Formation flow system, and (4) unweathered Denver Formation partially confined aquifer. Emphasis here is placed on characterizing the alluvial and unconfined Denver Formation aquifers because these zones represent the dominant component of the hydrologic system. They also represent the first water in the saturated zone that any contaminants moving through the vadose zone would encounter.

#### **A.4.2 Surface Water**

The surface water component in this area is limited to the infrequent collection of runoff in low-lying areas during major rain storms or snowmelt. No perennial surface water bodies exist in the area. An area in Site 36-17S adjacent to the parking lot north of December 7th Avenue is one area that occasionally holds ponded water after a substantial rainfall.

#### **A.4.3 Vadose Zone**

The vadose zone is the unsaturated material between the ground surface and the top of the saturated zone or perennial water table. In Site 36-17, this zone is composed of either unconsolidated surficial deposits or the upper Denver Formation. The vadose zone is important to this study because it is through this zone that contaminants must travel to reach the water table.

The rate of deep percolation in the study area is of particular importance in characterizing the vadose zone and evaluating contaminant migration. In Site 36-17, deep percolation includes recharge to the unconfined aquifer only from natural precipitation, runoff, and snowmelt. It does not include enhanced local infiltration derived from long-term, free-standing surface water such as lakes or streams since they do not exist in the area.

A detailed investigation conducted by MKE (1988a) concluded that infiltration from precipitation rarely percolates downward to reach the alluvial water table. The occurrence of recharge related to infiltration of precipitation is highly variable and dependent upon a number of unrelated factors. That report concluded that groundwater received only about 0.25 inch per year of recharge from infiltration of precipitation.



#### **A.4.4 Alluvial Aquifer**

For this report the alluvial aquifer is defined as the saturated portion of the alluvial unit and the unconfined, weathered portion of the Denver Formation that is in direct hydrologic communication with the alluvial unit. In the study area, groundwater in the alluvial aquifer flows north and northwest under unconfined conditions into the buried paleochannel that underlies Basin A, then northwest out of the Basin A neck. The hydraulic gradient in the study area is in the range of 0.003 to 0.03 foot per foot. The depth from the ground surface to the water table in the alluvial aquifer ranges from less than 5 feet to approximately 20 feet. Figure A-10 shows the alluvial aquifer groundwater contours in Section 36.

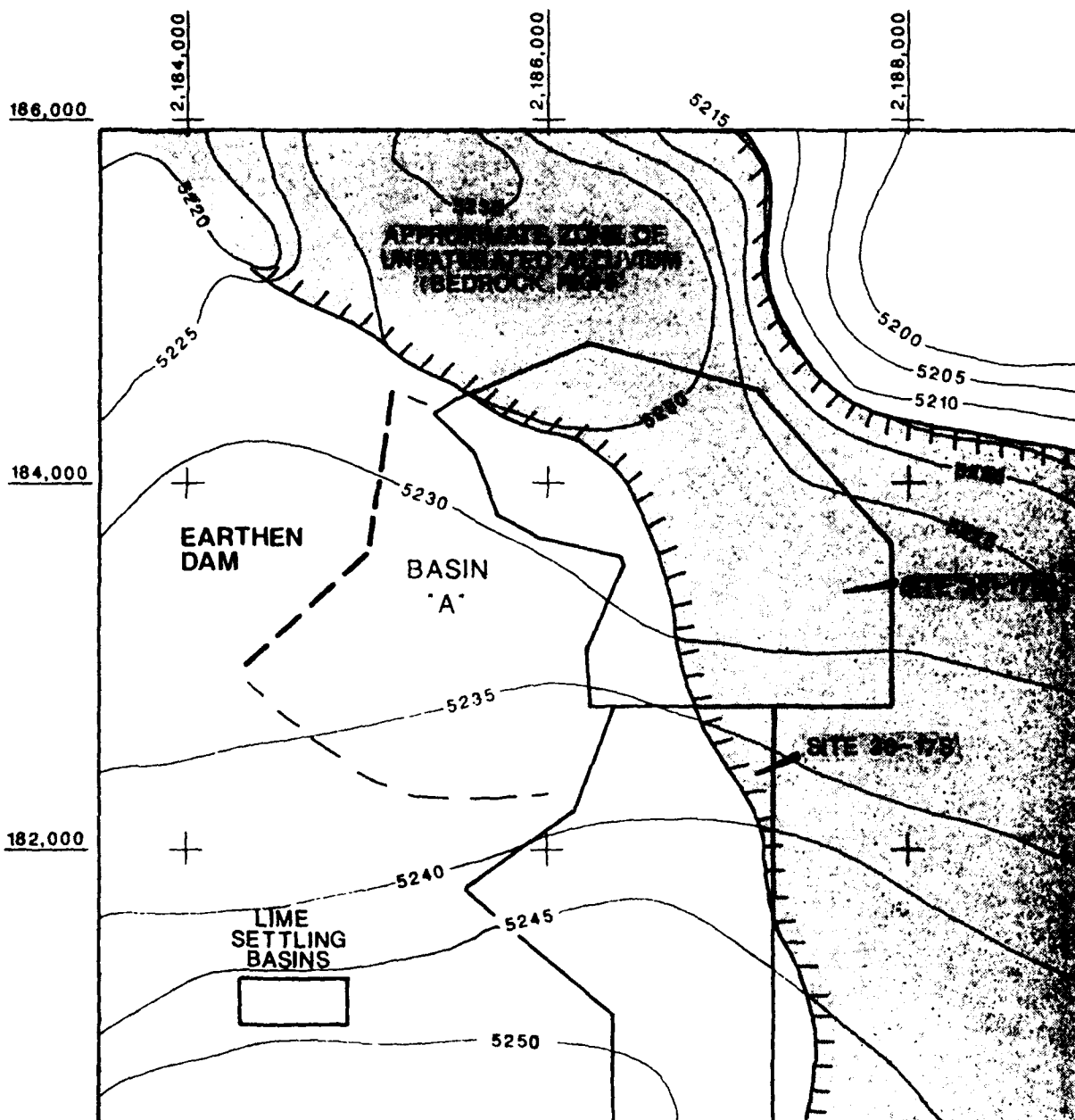
Well hydrographs for the past 6 years indicate that the water table elevation has been relatively steady but slightly declining in the study area. The hydrographs also indicate that recent seasonal water level fluctuations range from 2 to 3 feet and apparently now have a greater seasonal variation year to year for past comparable seasons.

The unconfined alluvial aquifer at RMA is composed of unconsolidated Quaternary deposits consisting of fine- to very fine-grained silty sand with occasional interbedded clayey silt overlying the upper weathered portion of the Denver Formation bedrock. Previous investigations indicated that there is a contrast in permeability between the alluvial and bedrock units of about two orders of magnitude. This is significant in evaluating the potential for contaminant migration. The CSAR estimates the hydraulic conductivity of the alluvial aquifer in this area to range from  $2.4 \times 10^{-3}$  to  $6.0 \times 10^{-3}$  cm/sec and the volcaniclastic unit to be about  $5 \times 10^{-3}$  cm/sec.

Alluvial groundwater flowing north through Section 36 encounters the bedrock ridge, which protrudes above the water table, and, due to the sharp contrast in hydraulic conductivities, is forced to turn and flow northwest out the Basin A neck. The Basin A neck is a relatively narrow paleochannel between Rattlesnake Hill in Section 35 and the prominent bedrock ridge that cuts across Section 36.

Because of the difference in hydraulic conductivity between the alluvial and bedrock materials and the reduced cross-sectional area in the Basin A neck, the groundwater forms an apparent mound in the Basin A area as evidenced by the relatively flat hydraulic gradient in the basin (refer to Figure A-10). The apparent mound, coupled with the lower surface elevation in the basin, results in the shallow depth to groundwater in the west central portion of Section 36.

The groundwater contour map shows a sharp increase in the hydraulic gradient northeast of the ridge. The gradient increases because water moving through the ridge is slowed by the two order of magnitude drop in



Section 36



FROM ESE 1988



Job No. : 22238-A

Prepared by : R.C.C.

Date : 11/16/89

SECTION 36

GROUNDWATER ELEVATION MAP  
SHOWING BEDROCK HIGH  
Figure A 10

hydraulic conductivity of the unit. Before the water can continue moving through the ridge, the gradient must increase enough to offset the lower permeability. Water will eventually move through the Denver Formation ridge, but at a much slower rate than it travels in the alluvial unit.

#### **A.4.5 Previous Investigations**

Past studies at Site 36-17 were generally designed to characterize the physical setting, evaluate the nature and extent of contamination, and assess possible contaminant migration pathways. The investigations at Site 36-17 were conducted in two phases during which a variety of investigative techniques were employed including extensive use of geophysical surveys, borehole drilling and sampling, well construction and sampling, and trenching. During the previous investigations, 317 samples of soil, waste, and water were collected in Site 36-17. The Phase I and Phase II Contamination Assessment Reports and the Central Study Area Report present the findings of those investigations.

#### **A.4.6 Nature and Extent of Contamination**

The previous studies conducted to evaluate contamination in Site 36-17 concluded that past waste disposal resulted in widespread contamination in the area. The precise contaminant distribution trends are difficult to assess due to the varied disposal history and resulting heterogeneous nature of the waste. However, Section 2.0 of the Remedial Investigation Report for the Central Study Area (CSAR) presents a detailed evaluation of the distribution of contamination in Site 36-17. Figures showing contaminant plumes in Site 36-17 groundwater are contained in Section 3.0 of the CSAR. See Figures 3.1-7, 3.1-8, 3.1-9, 3.1-10, 3.1-11, 3.1-14, and 3.1-15 of the CSAR for plumes including volatile hydrocarbons, volatile aromatics, organosulfur compounds (mustard related), organosulfur compounds (herbicide related), GB-agent related organophosphorous compounds, organochlorine pesticides, and arsenic, respectively. (Refer to that document if additional detail is desired.) A review of the reported findings of the previous investigations indicate that the following general conditions exist at Site 36-17:

- Contaminants found above indicator levels or detection limits in Site 36-17 soil and/or water samples include the ICP metals (cadmium, chromium, copper, lead, and zinc), arsenic, mercury, aldrin, dieldrin, fluoroacetic acid, chlordane, isodrin, dithiane, oxathiane, DIMP, IMPA, hexachlorocyclopentadiene, DDE, DDT, and DBCP.
- Several disposal trenches apparently intersect the shallow alluvial aquifer or became inundated when the water level rose in Basin A.

- Contaminants have apparently leached from several trenches to a depth of at least 20 feet below ground surface.
- There is a general increase in the number of analyte detections and concentrations in groundwater downgradient of the Site 36-17 disposal trenches, however, most of the analyte detections appear to originate at the Shell trenches in 36-17S.
- The disposal trenches can be generally categorized by their relative groundwater contamination hazard and assigning relative risk based on the depth to groundwater as follows:
  1. Trenches excavated in areas of topographic lows and potentiometric highs. These trenches may intersect the alluvial aquifer and, therefore, run the highest risk of contaminating the groundwater.
  2. Trenches excavated in areas of intermediate topographic and potentiometric elevations. The bottoms of these trenches are typically 5 to 15 feet above groundwater.
  3. Trenches excavated in areas of topographic highs and potentiometric lows. The bottoms of these trenches are typically more than 15 feet above groundwater. In some areas, the alluvial aquifer does not exist because of the topographic high in the bedrock surface.

These general conditions were important in evaluating which of the 46 previously confirmed disposal trenches represented the greatest risk of contaminating groundwater at Site 36-17. Generally, the trenches of highest risk containing the highest concentrations of contaminants were selected for further investigation under this program.

#### **A.5 LIME SETTLING BASINS SITE GEOLOGY**

There are two stratigraphic units of interest beneath the Lime Settling Basins: (1) the Quaternary Surficial deposits consisting of unconsolidated alluvial and erosion material, and (2) the Denver Formation. The alluvial material ranges from 15 feet to approximately 30 feet in thickness and consists of yellowish-brown, fine-grained, well-sorted, subangular silty sand.

The Denver Formation, to the maximum depth penetrated, consists of very stiff to hard, blocky, dusky brown claystone and silty claystone deposited in an ancient fluvial environment.

## Woodward-Clyde Consultants

Before and during the deposition of the surficial material, an ancient stream system eroded the surface of the Denver Formation. As a result, the contact between the two stratigraphic units is highly irregular. Regionally, the bedrock surface of the Denver Formation slopes to the northwest. However, at the Lime Settling Basins, the bedrock surface slopes to the north-northeast.

The soil at the Lime Settling Basins is usually from the Ascalon-Vona-Truckton Association, which generally ranges from nearly level to steeply sloping, well-drained to excessively drained loamy and sandy soil. The soil typically becomes clay-rich and calcareous with depth. Alluvial thickness isopachs and the elevation of the top of the Denver Formation are included in Figures A-1 and A-3. Figure A-11 is a geologic cross-section of the Lime Settling Basins area.

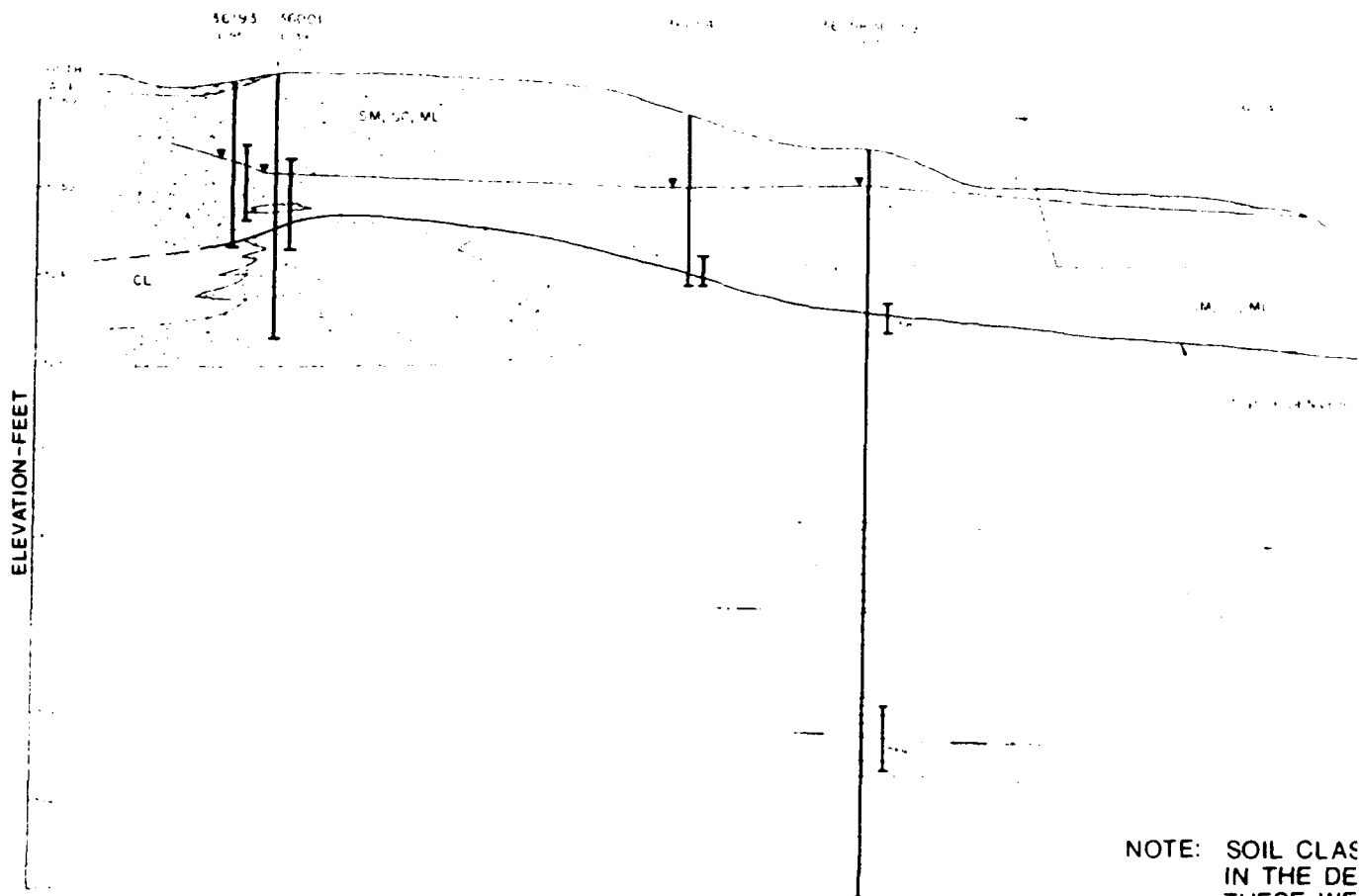
### A.5.1 Lime Settling Basins Site Hydrology

The Lime Settling Basins are in a local topographic low in the southwest quadrant of Section 36. The elevation of standing water occurring in a portion of the Lime Settling Basins was measured in July 1989. Based on a measurement of 5,247 feet above mean sea level and water levels measured from surrounding wells, it appears the standing water corresponds with the local water table. Surface water currently drains from the Lime Settling Basins into Basin A as it was originally built to do. At one time, a drainage ditch also connected the Lime Settling Basins with Basin B in Section 36.

The Lime Settling Basins are situated hydrologically downgradient of the M-1 Settling Basins and the South Plants. While the regional direction of groundwater flow at the RMA is generally to the northwest, the groundwater flow in the Lime Settling Basins area is nearly due north, which is probably due to the influence of local bedrock paleotopographic influences and the groundwater mound that exists in the South Plants area.





The saturated alluvial material is from 5.4 to 18.4 feet thick at the Lime Settling Basins. Water levels measured in July 1989 for wells screened in the alluvial material ranged from 4 to 14.6 feet below ground level. Figure A-11 shows the potentiometric surface based on the July 1989 water measurements.

The Denver Formation is saturated within the site and may contain some local confined aquifers. The more hydraulically conductive units in the formation are expected to be subhorizontal sandstone or siltstone bodies adjacent to less conductive claystone. The direction of groundwater flow is expected to be generally the same as that of the alluvial groundwater.






### LEGEND

#### ALLUVIUM

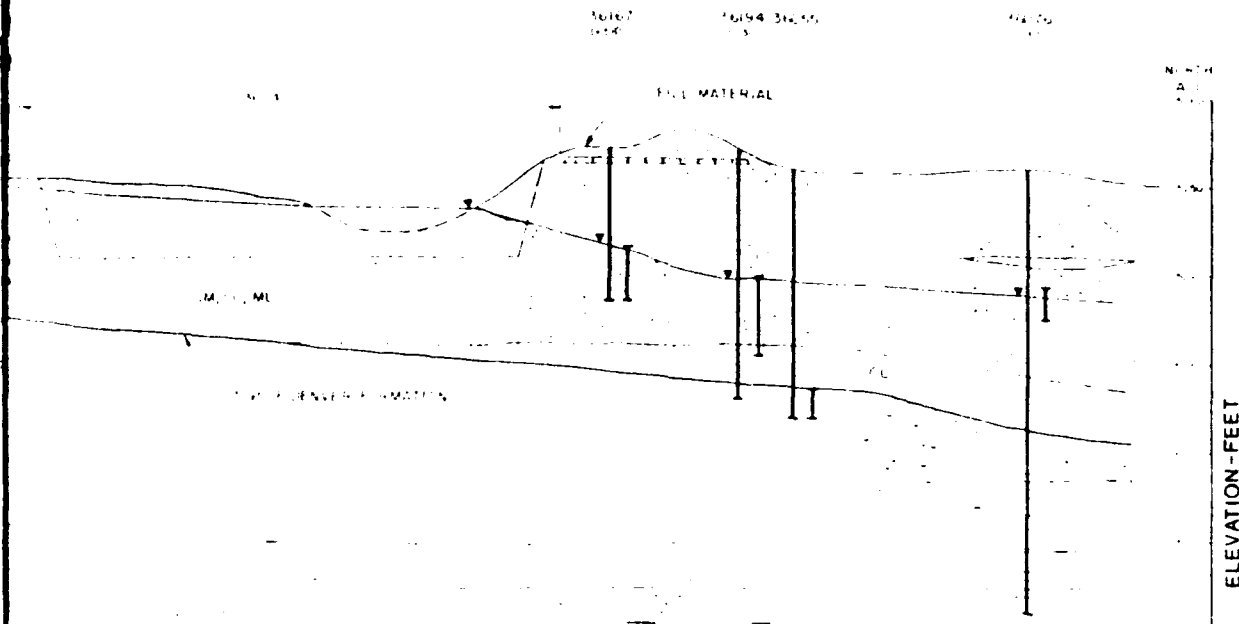
-  BACKFILL MATERIAL
-  LIME RESIDUE
-  SILTY SANDS, CLAYEY SANDS AND INORGANIC SILTS (SM, SC, ML)
-  INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, OCCASIONALLY SANDY AND/OR SILTY

#### DENVER FORMATION

-  SANDSTONE, GREEN TO GRAY, FINE TO COARSE GRAINED
-  SILTSTONE, GRAY, OCCASIONALLY SANDY, HARD
-  CLAYSTONE, SHALE, GRAY TO BLACK, SOFT TO HARD, OCCASIONALLY SANDY AND/OR SILTY

36193 --- WELL N  
(-95') --- DISTANCE  
+(EAST)  
-(WEST)

GROUND  
ALLUVIUM  
SCREEN  
CLUSTER  
TOP OF



NOTE: SOIL CLASSIFICATIONS WERE USED TO DESCRIBE ROCKS IN THE DENVER FORMATION IN SOME OF THE BORINGS. THESE WERE CHANGED ON THE CROSS-SECTION TO SHOW CONSOLIDATED ROCKS OF EQUIVALENT GRAIN SIZE. AN EXAMPLE WOULD BE CLAY TO CLAYSTONE OR SHALE. FOR LOCATION OF CROSS-SECTION A1-A1'. SEE FIGURE A-1

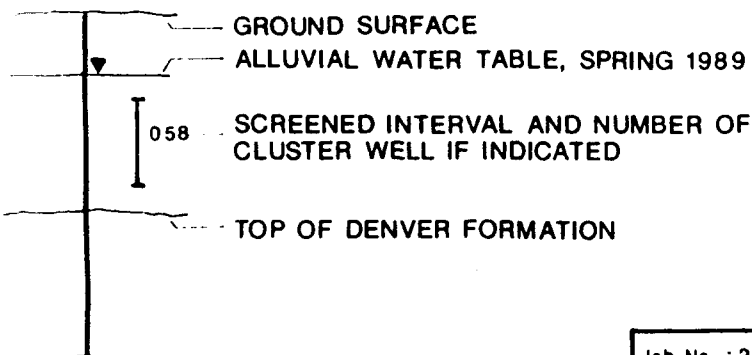
36193 --- WELL NUMBER  
 (-95') --- DISTANCE PROJECTED TO SECTION LINE  
 + (EAST OF SECTION LINE)  
 - (WEST OF SECTION LINE)

10 X VERTICAL EXAGGERATION

0 50 100 200  
 HORIZONTAL

0 5 10 20  
 VERTICAL

SCALE IN FEET



Job No. : 22238

LIME SETTLING BASIN - AREA 36-4

Prepared by : R.C.L.

GEOLOGIC CROSS-SECTION A3-A3'

Date : 8/15/89

(Figure A-1)

Figure A-11

A-25

FIG.

### **A.5.2 Previous Soils Investigations**

The Lime Settling Basins (Site 36-4) was investigated by ESE in two phases. Phase I consisted of 10 borings ranging in depth from 3 to 11 feet yielding 27 soil samples. Results from chemical analyses indicate elevated concentrations of aldrin, chlordane, dieldrin, endrin, heptachlor, DDE, and DDT. Although samples contained less than 0.4 ppm lead, other metals, including zinc, copper, and arsenic occurred at elevated levels.

All samples from Phase I were analyzed by gas chromatography/mass spectrometry (GC/MS) for semivolatile organic compounds and by inductively coupled argon plasma (ICP) analyses for cadmium, chromium, copper, lead, and zinc. Analyses for mercury and arsenic were conducted using atomic absorption (AA) spectroscopy, and for dibromochloropropane using gas chromatography (GC). Volatile organic analyses by GC/MS were performed on all samples more than 1 foot in depth.

The Phase II program was initiated in the summer of 1987 by ESE. It included the expansion of the study area boundaries to include data from sites around the original study area that Phase I results indicated were contaminated. Areas that were not studied in Phase I were included in Phase II. A geophysical survey was performed along the expanded western boundary of the site to locate buried metal objects. Eighteen soil borings were completed in Phase II, ranging in depth from approximately 3 to 10 feet. The 18 borings yielded 47 soil samples from various depths.

Phase II samples were analyzed for arsenic, mercury, ICP metals, organochlorine pesticides, organosulphur compounds, dibromochloropropane, dicyclopentadiene, volatile halocarbon compounds, and volatile aromatic compounds since Phase I samples were found to contain these compounds. Seven samples were analyzed for Army agent degradation products (ADP) since this method was not available in Phase I.

### **A.5.3 Previous Groundwater Investigations**

Since 1983, groundwater samples from three wells in the Lime Settling Basins area have been analyzed for contaminants. These wells are No. 36001 (upgradient), No. 36076 (downgradient), and No. 36058. Contaminants analyzed include volatile organics, aromatic compounds, organochlorine pesticides (OCPs), DIMP, DMMP, and ICP metals. Arsenic analysis was not performed.



#### A.5.4 Nature and Extent of Soils Contamination

Contaminants expected at the site include raw materials, manufacturing by-products, and numerous degradation products associated with the synthesis of mustard, lewisite, and pesticides in the South Plants area.

The findings of the previous studies are consistent with the history of the area. Of the 16 borings completed and sampled by ESE, each contained detectable concentrations of one or more OCPs, including aldrin, dieldrin, endrin, and isodrin. Elevated concentrations of dieldrin were detected in 12 of 22 samples at concentrations ranging from 0.6 to 70  $\mu\text{g/g}$ . Aldrin was detected in 9 samples at concentrations up to 600  $\mu\text{g/g}$ . Endrin and isodrin were detected at levels up to 200  $\mu\text{g/g}$  and 300  $\mu\text{g/g}$ , respectively.

Organosulphur compounds, chlorophenylmethyl sulfide (CPMS), chlorophenylmethyl sulfoxide (CPMSO), and chlorophenylmethyl sulfone (CPMSO<sub>2</sub>) were detected in four borings at concentrations up to 50  $\mu\text{g/g}$ . DCPD and DDE were detected in two borings, and DBCP was detected in three borings. DDT was found in one boring at 7  $\mu\text{g/g}$  in the 0- to 1-foot depth interval.

Volatile organic compounds (VOC) were detected in five samples collected from the deepest intervals of five borings. Chloroform occurred in four of the five borings at concentrations ranging from 2 to 7  $\mu\text{g/g}$ . Concentrations of methylene chloride were detected in two borings at concentrations of 2 and 0.9  $\mu\text{g/g}$ . Benzene concentrations ranging from 5 to 6  $\mu\text{g/g}$  were found in two borings. Chlorobenzene was also detected at 2  $\mu\text{g/g}$ .

Arsenic and mercury were the most prevalent metals found in samples from the site. Mercury was found at elevated concentrations in 13 samples and was detected in a total of 17 samples. Arsenic was detected in 16 samples at concentrations up to 370  $\mu\text{g/g}$ . Four samples contained elevated copper; lead exceeded its indicator range in two samples; and zinc exceeded its indicator range in three samples. Six samples contained cadmium; three in excess of the indicator range. Chromium was found within its indicator range in one sample.

DCPD was detected at a concentration of 7.1  $\mu\text{g/g}$  in the 2- to 3-foot interval of Boring No. 3421 in the central area. DBCP and volatile and aromatic (VAO) compounds were not detected in the central region. Tetrachloroethene was detected at a concentration of 0.25  $\mu\text{g/g}$  in Boring No. 3422. ADP compounds were detected in the central region of Site 36-4 in Boring Nos. 3421, 3422, and 3732.

Nontarget compounds were also detected in Phase II soils. Compounds detected were polycyclic aromatic hydrocarbons (PAH), including anthracene, pyrene, and fluoranthene at concentrations from 20 to 100  $\mu\text{g/g}$ .

Also detected were bicycloheptadiene, hexachlorobutadiene, trichlorobenzenamine, and methylsulfonyldinitro-n, n-dipropyl-benzenamine, which was detected at 200 µg/g.

#### **A.5.5 Nature and Extent of Groundwater Contamination**

Three wells located in the Lime Settling Basins that were sampled since 1983 revealed the presence of contaminants, including VOCs, aromatics, OCPs, metals, and others. Of the VOCs, trichloroethylene, tetrachloroethylene, chloroform, and DBCP were all detected in both upgradient and downgradient wells at elevated concentrations.

Aromatics detected in both upgradient and downgradient wells include benzene, toluene, xylene, chlorobenzene, and dichlorobenzene. Trichlorobenzene and tetrachlorobenzene were also detected in water from wells in the area but were not specific to a particular well.

Aldrin was detected in upgradient and downgradient wells in the area. Dieldrin, endrin, and isodrin were all detected in downgradient wells.

Metals detected in water from wells in the area include arsenic (downgradient), mercury (upgradient), and chromium (upgradient). Copper was detected in both upgradient and downgradient wells. Other compounds detected in water from wells in the Lime Settling Basins area include chlorophenylmethyl sulfane, dimethyl sulfide, DIMP, DMMP, and dithiane.

#### **A.6 MOTOR POOL AREA SITE GEOLOGY**

The Motor Pool Area is in Section 4 on the Western edge of the RMA. There are two stratigraphic units of interest beneath the Motor Pool Area: (1) the Quaternary Alluvium, and (2) the Denver Formation. The alluvial material consists of discontinuous lenses of sand and gravel, interbedded with silt and clay. Gravels and gravelly sands are common at the base of the alluvial section, especially in paleochannels. The alluvial material ranges from about 70 feet to about 100 feet in thickness. The thickest alluvium occurs over bedrock lows and the thinnest over bedrock highs.

The alluvial-bedrock contact is highly irregular due to the extensive erosion by ancient streams. Generally, the bedrock surface slopes to the northwest in the Motor Pool Area; however, where the bedrock surface has been incised by an ancient stream channel, the slope becomes perpendicular to the trend of the paleochannel. A

northwest trending paleochannel cuts across the northern boundary of the Motor Pool Area and has approximately 70 feet of relief.

The Denver Formation in the Motor Pool Area is predominantly composed of claystone with interbedded sandstone, siltstone, and lignite layers from 2 to approximately 20 feet thick. Layers of volcanoclastic material are also present.

#### **A.6.1 Motor Pool Area Site Hydrology**

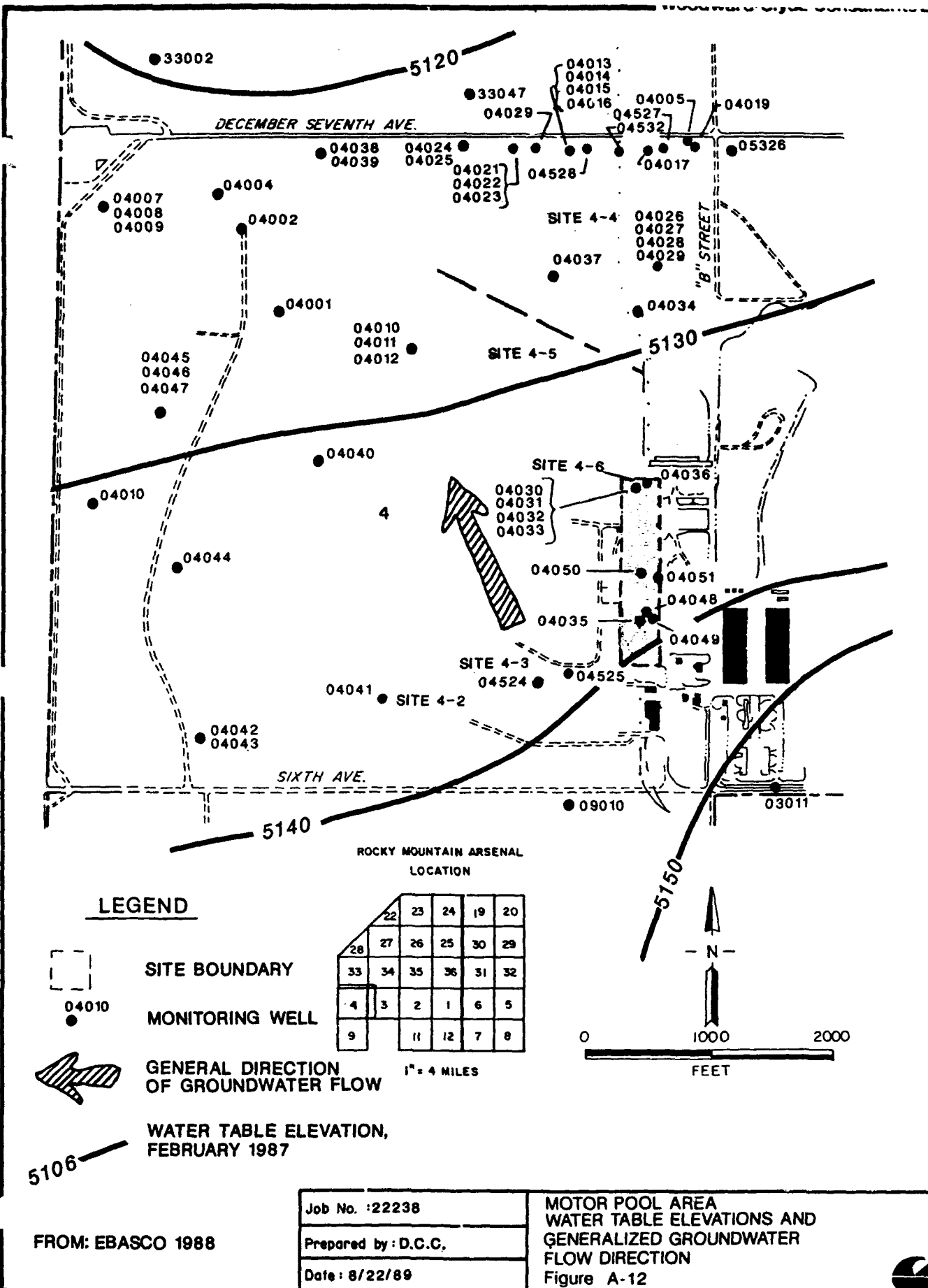
Site 4-6 is situated in the Irondale Gulch drainage basin. It has an average elevation of 5,200 feet above mean sea level (msl) and a local relief of 5 feet. In the northern portion of the area, surface water drains north and is controlled by railroad embankments and drainage ditches. The surface water from the southern portion of the area drains west into a drainage ditch and then continues northwest into a local topographic depression.

Groundwater within the alluvium is approximately 60 feet below the ground surface and it flows to the northwest and north-northwest. The February 1987 water table and groundwater flow direction, as determined by Ebasco Services (1988), is shown in Figure A-12.

The Denver Formation is saturated within the site and may contain some local confined aquifers. The more hydraulically conductive units in the formation are expected to be subhorizontal sandstone or siltstone bodies adjacent to less conductive claystone. The direction of groundwater flow is expected to be generally the same as that of the alluvial groundwater.

#### **A.6.2 Previous Investigations**

Previous studies done in the Motor Pool Area include: a May 1984 RCRA audit done by the Colorado Department of Health in the area outside the roundhouse; a 1986 study to identify possible trichloroethylene sources in the Motor Pool Area; and a soil gas study conducted in February 1986 to aid in defining trichloroethylene plumes in the groundwater. The most recent studies include a Contamination Assessment Report, and Western Study Area Remedial Investigation (Ebasco 1989). The following sections describe the intrusive investigation focused on the reported TCE plume in the Motor Pool Area.



#### **A.6.3 Soils**

Site 4-6 was investigated by Ebasco under Task 38. Field work began in the spring of 1986. Ebasco's Task 38 Technical Plan (Ebasco 1987b) called for 25 borings to be drilled to depths of from 1 to 90 feet. A total of 125 soil samples were to be taken from these borings. Two additional borings were proposed in a letter technical plan (Ebasco 1987a). The sampling program was augmented to include a total of 166 samples from 36 borings and 1 soil grab sample that was taken from the drainage ditch west of Building 627 on the eastern side of the railroad tracks.

All but two samples were analyzed by gas chromatography/mass spectrometry (GC/MS) for volatile organics (except the 0- to 1-foot interval) and semivolatile organics. All but four samples were analyzed by inductively coupled argon plasma (ICP) screen for metals. The same samples were analyzed separately for arsenic and mercury. Several samples were analyzed for dibromochloropropane.

#### **A.6.4 Water**

Three water samples were taken by Ebasco in Site 4-6. The first was taken during the drilling of a 1-foot boring in the sump within the roundhouse in June 1986. The water that was sampled had seeped into the borehole through cracks in the concrete sump. The two remaining samples were taken from a 3-foot by 4-foot cavity that was suspected to be a collapsed septic tank located approximately 15 feet north of the roundhouse (Ebasco 1988).

#### **A.6.5 Soil Ga**

Several soil gas studies were conducted in the area during February 1986 by Ebasco to evaluate the concentration of trichloroethylene (TCE) in the Motor Pool Area soil. The soil gas survey sampled locations along several transect lines staked across the area. Line spacing ranged from about 250 to 750 feet, and the distance between sample locations ranged between 100 to 250 feet. A detailed description of the soil gas survey is contained in Ebasco 1987c.

#### **A.6.6 Nature and Extent of Soils Contamination**

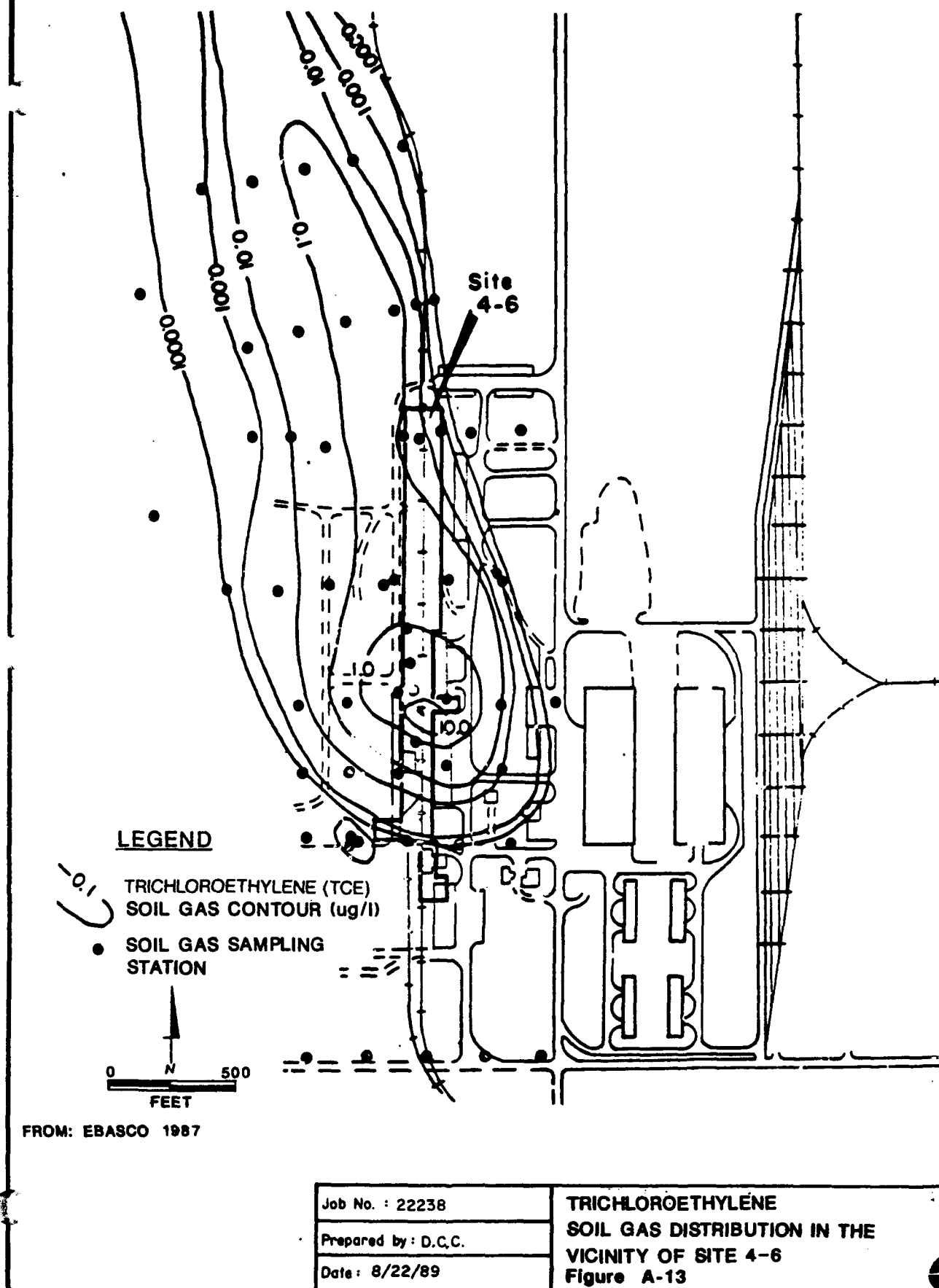
Contaminants found in soils at the Motor Pool Area within or above their indicator levels include ethylbenzene, tetrachloroethylene, trichloroethylene, m-xylene, toluene, methylene chloride, dibromochloropropane, aldrin, cadmium, chromium, copper, lead, zinc, arsenic, and mercury (Ebasco 1988).

**A.6.7 Nature and Extent of Water Contamination**

Samples of alluvial water were collected and analyzed by Ebasco in 1986 and 1987. Analytes found within or above their indicator ranges (in this case, their detection limits) include 1,1-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane benzene, chloroform, trans-1,2-dichloroethylene, and trichloroethylene. The spatial distribution of the wells with detected contaminants indicate that some of these contaminants could originate at a source somewhere in the Motor Pool Area; however, a larger off-post source is also indicated.

**A.6.8 Nature and Extent of Soil Gas Contamination**

The data collected during the soil gas survey indicate trichloroethylene contamination of soil in the area north of Building 631; however, the information was not sufficient to identify a specific source. The concentrations detected in soil gas could not be confirmed by analysis of soil samples due to the higher certified method detection limit of the soil sample analysis. Figure A-13 shows the distribution of trichloroethylene indicated by the soil gas survey. Additional detail concerning the soil gas data is contained in a report by Ebasco (Ebasco 1987c).



**APPENDIX B**  
**HEALTH AND SAFETY/PERSONNEL AIR SAMPLING**

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Sampling Site: Section 36 Suspect Asbestos

Sample Collected by: Eric Masamori  
Sample Analysis by: DataChem

Date of Collection: 22 May 1989

Date of Analysis: 23 and 31 May 1989

Field Sample Number	Sample Type	Amosite Asbestos	Chrysotile Asbestos	Crocidolite Asbestos	Actinolite/ Tremolite Asbestos	Anthophyllite Asbestos	Cellulose Fiberglass	Mineral Wool	Synthetic Fibers
5/22/01	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/02	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/03	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/04	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/05	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/06	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/07	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/08	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/09	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/10	Bulk	70-<80%	ND	ND	ND	ND	...	...	...
5/22/11	Bulk	ND	ND	ND	ND	ND	ND	90-<100%	ND
5/22/12	Bulk	ND	ND	ND	ND	ND	...	...	...
5/22/13	Bulk	ND	ND	ND	ND	ND	<1 %	90-<100%	ND
5/22/14	Bulk	ND	ND	ND	ND	ND	...	...	...
5/22/15	Bulk	ND	ND	ND	ND	ND	...	...	...
5/22/16	Bulk	ND	ND	ND	ND	ND	...	...	...
5/22/17	Bulk	ND	ND	ND	ND	ND	...	...	...
5/22/18	Bulk	ND	ND	ND	ND	ND	ND	70-<80%	ND
5/22/19	Bulk	ND	ND	ND	ND	ND	...	...	...
5/22/20	Bulk	ND	ND	ND	ND	ND	ND	90-<100%	ND

Sampling Site: 36-054

Date of Collection: 13 June 1989

Date of Analysis: 15, 16, 19 and 21 June 1989

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-129	Filter	ND	129	252	---	---	0.01	0.2
Arsine	AS-123	CT	ND	76	7.8	---	---	0.2	0.02
	AS-124	CT	ND	41	4.2	---	---		
Aldrin	AS-126	Filter	ND	76	115	---	---	0.25	0.003
	AS-127	Filter		41	62				
Dieldrin	AS-126	Filter	ND	76	115	---	---	0.25	0.006
	AS-127	Filter	ND	41	62				
Dicyclopentadiene	AS-126	Filter	ND	76	115	---	---	30	0.2
	AS-127	Filter	ND	41	62				
Hexachlorocyclopentadiene	AS-131F	Filter	ND	125	12.8	---	---	0.1*	0.003
	AS-131T	Tube	ND	125	12.8	---	---		
Lead	AS-133	Filter	ND	129	256	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: 36-054: Field Blank

Date of Collection: 13 June 1989

Date of Analysis: 15, 16, 19 and 21 June 1989

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field		Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
	Sample Number									
Arsenic Trifluoride	AS-130	Filter	ND	...	...	...	...	...	0.01	0.2
Arsine	AS-125	CT	ND	...	...	...	...	...	0.2	0.02
Aldrin	AS-128	Filter	ND	...	...	...	...	...	0.25	0.003
Dieldrin	AS-128	Filter	ND	...	...	...	...	...	0.25	0.006
Dicyclopentadiene	AS-128	Filter	ND	...	...	...	...	...	30	0.2
Hexachlorocyclopentadiene	AS-132F	Filter	ND	...	...	...	...	...	0.1*	0.003
	AS-132T	Tube	ND	...	...	...	...	...		
Lead	AS-134	Filter	ND	...	...	...	...	...	0.05	3
Total Dust	...	Filter	...	...	...	...	...	...	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

**Sampling Site: 36-187**

Date of Collection: 5 May 1989

Date of Analysis: 10, 15, and 17 May

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-008	Filter	ND	230	469	...	...	0.01	0.2
Arsine	AS-011	CT	ND	60	6.52	...	...	0.2	0.02
	AS-013	CT	ND	50	5.4	...	...		
Aldrin	AS-010	Filter	ND	113	232	...	...	0.25	0.003
Dieldrin	AS-010	Filter	ND	113	232	...	...	0.25	0.006
Dicyclopentadiene	...	Filter	...	...	...	...	...	30	0.2
Hexachlorocyclopentadiene	...	Filter	...	...	...	...	...	0.1*	0.003
	AS-012	Tube	ND	60	5.79	...	...		
	AS-014	Tube	ND	50	4.8	...	...		
Lead	AS-009	Filter	ND	230	469	...	...	0.05	3
Total Dust	...	Filter	...	...	...	...	...	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: 36-188

Date of Collection: 3 May 1989  
Date of Analysis: 10 and 17 May 1989

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-005	Filter	ND	223	449.1	---	---	0.01	0.2
Arsine	AS-003	CT	ND	223	23.3	---	---	0.2	0.02
Aldrin	---	Filter	---	---	---	---	---	0.25	0.003
Dieldrin	AS-007	Filter	ND	230	471.5	---	---	0.25	0.006
Dicyclopentadiene	---	Filter	---	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
	AS-004	Tube	ND	223	11.08	---	---	---	---
Lead	AS-006	Filter	ND	230	468	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: 36-191

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 10 May 1989  
Date of Analysis: 15, 16, 17 May and 5 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-033	Filter	ND	95	186.5	---	---	0.01	0.2
Arsine	AS-028	CT	ND	95	10.64	---	---	0.2	0.02
Aldrin	AS-030	Filter	ND	95	144	---	---	0.25	0.003
Dieldrin	AS-030	Filter	ND	95	144	---	---	0.25	0.006
Dicyclopentadiene	AS-030	Filter	ND	95	144	---	---	30	0.2
Hexachlorocyclopentadiene	AS-029F	Filter	ND	95	8.835	---	---	0.1*	0.003
	AS-029T	Tube	ND	95	8.835	---	---		
Lead	AS-032	Filter	ND	95	191.4	---	---	0.05	3
Total Dust	AS-031	Filter	0.01 mg	29	49	0.204	0.012	15	0.01
	AS-034	Filter	0.02 mg	66	111.6	0.179	0.025		

Equivalent exposure for mixture of compounds = 0.0255

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: 36-191: Field Blank

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 10 May 1989

Date of Analysis: 15, 16, 17 May and 5 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m <sup>3</sup>	8-hr TWA mg/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>	Limit of Detection (ug)
Arsenic Trioxide	AS-038	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-037	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-040	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-040	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	AS-040	Filter	ND	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	AS-035F AS-035T	Filter Tube	ND ND	---	---	---	---	0.1*	0.003
Lead	AS-036	Filter	ND	---	---	---	---	0.05	3
Total Dust	AS-039	Filter	0.01	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

**Sampling Site: 36-192**

**Date of Collection: 18 May 1989**

**Date of Analysis: 19, 23 and 26 May 1989**

**Sample Collected by: Daniel Burgess**  
**Sample Analysis by: DataChem**

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-071	Filter	ND	197	402	---	---	0.01	0.2
Arsine	AS-062	CT	ND	58	5.9	---	---	0.2	0.02
	AS-063	CT	ND	47	4.8	---	---		
	AS-068	CT	ND	90	9.19	---	---		
Aldrin	AS-066	Filter	ND	107	161	---	---	0.25	0.003
	AS-069	Filter	ND	88	133	---	---		
Dieldrin	AS-066	Filter	ND	107	161	---	---	0.25	0.006
	AS-069	Filter	ND	88	133	---	---		
Dicyclopentadiene	AS-066	Filter	ND	107	161	---	---	30	0.2
	AS-069	Filter	ND	88	133	---	---		
Hexachlorocyclopentadiene	AS-064	Filter	ND	58	6	---	---	0.1*	0.003
	AS-065	Filter	ND	137	14.1	---	---		
	---	Tube	---	---	---	---	---		
Lead	AS-070	Filter	ND	197	399	---	---	0.05	3
Total Dust	AS-060	Filter	0.00 mg	67	117.5	0.00	0.00	15	0.01
	AS-061	Filter	0.00 mg	57	99.9	0.00	0.00		
	AS-067	Filter	0.03 mg	71	124	0.242	0.036		

Equivalent exposure for mixture of compounds = 0.0161

ND = Parameter not detected

\*ACGIH time-weighted average



Sampling Site: 36-192: Field Blank

Date of Collection: 18 May 1989

Date of Analysis: 19, 23 and 26 May 1989

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-074	Filter	ND	...	...	...	...	0.01	0.2
Arsine	AS-073	CT	ND	...	...	...	...	0.2	0.02
Aldrin	AS-076	Filter	ND	...	...	...	...	0.25	0.003
Dieldrin	AS-076	Filter	ND	...	...	...	...	0.25	0.006
Dicyclopentadiene	AS-076	Filter	ND	...	...	...	...	30	0.2
Hexachlorocyclopentadiene	AS-072	Filter	ND	...	...	...	...	0.1*	0.003
	...	Tube	...	...	...	...	...		
Lead	AS-077	Filter	ND	...	...	...	...	0.05	3
Total Dust	AS-075	Filter	0.01	...	...	...	...	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

**Sampling Site: 36-193**

Date of Collection: 16 May 1989  
 Date of Analysis: 17, 18 23 and 26 May 1989

Sample Collected by: Daniel Burgess  
 Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-050	Filter	ND	156	315	---	---	0.01	0.2
Arsine	AS-048	CT	ND	89	9.9	---	---	0.2	0.02
	AS-053	CT	ND	67	7.5	---	---		
Aldrin	AS-047	Filter	ND	115	174	---	---	0.25	0.003
Dieldrin	AS-047	Filter	ND	115	174	---	---	0.25	0.006
Dicyclopentadiene	AS-047	Filter	ND	115	174	---	---	30	0.2
Hexachlorocyclopentadiene	AS-052	Filter	ND	156	14.9	---	---	0.1*	0.003
	---	Tube	---	---	---	---	---		
Lead	AS-051	Filter	ND	156	313	---	---	0.05	3
Total Dust	AS-046	Filter	0.02 mg	72	128	0.156	0.023	15	0.01
	AS-049	Filter	0.00 mg	69	123	0.00	0.00		

Equivalent exposure for mixture of compounds = 0.0104

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: 36-193: Field Blank

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 16 May 1989  
Date of Analysis: 17, 18, 23 and 26 May 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-058	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-054	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-059	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-059	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	AS-059	Filter	ND	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	AS-055	Filter	ND	---	---	---	---	0.1*	0.003
	---	Tube	---	---	---	---	---		
Lead	AS-057	Filter	ND	---	---	---	---	0.05	3
Total Dust	AS-056	Filter	0.00	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: 36-193

Date of Collection: 7 June 1989

Date of Analysis: 12, 14, 15 and 19 June 1989

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-118	Filter	ND	166	323	---	---	0.01	0.2
Arsine	AS-114	CT	ND	91	9.4	---	---	0.2	0.02
	AS-115	CT	ND	75	7.8	---	---	---	---
Aldrin	AS-116	Filter	ND	115	176	---	---	0.25	0.003
Dieldrin	AS-116	Filter	ND	115	176	---	---	0.25	0.006
Dicyclopentadiene	AS-116	Filter	ND	115	176	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
	---	Tube	---	---	---	---	---	---	---
Lead	AS-117	Filter	ND	166	330	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

**Sampling Site: 36-193: Field Blank**

Date of Collection: 7 June 1989

Date of Analysis: 12, 14, 15 and 19 June 1989

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m <sup>3</sup>	8-hr TWA mg/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>	Limit of Detection (ug)
Arsenic Trioxide	AS-122	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-119	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-120	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-120	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	AS-120	Filter	ND	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
	---	Tube	---	---	---	---	---		
Lead	AS-121	Filter	ND	---	---	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

# HVIA TASK 4 PERSONAL AIR MONITORING

Sampling Site: 36-194

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 16 June 1989

Date of Analysis: 20 and 21 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-141	Filter	ND	130	255	---	---	0.01	0.2
Arsine	AS-137	CT	ND	40	4.1	---	---	0.2	0.02
	AS-138	CT	ND	85	8.8	---	---		
Aldrin	AS-139	Filter	ND	115	177	---	---	0.25	0.003
Dieldrin	AS-139	Filter	ND	115	177	---	---	0.25	0.006
Dicyclopentadiene	---	Filter	---	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
	---	Tube	---	---	---	---	---		
Lead	AS-140	Filter	ND	130	260	---	---	0.05	3
Total Dust	AS-135	Filter	-0.02	55	96	-0.208	-0.024	15	0.01
	AS-136	Filter	0.00	75	131	0.00	0.00		

Equivalent exposure for mixture of compounds = -0.0139

ND = Parameter not detected

\*ACGIH time-weighted average

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Sampling Site: 36-194: Field Blank

Date of Collection: 16 June 1989

Date of Analysis: 20 and 21 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-146	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-143	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-144	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-144	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	---	Filter	---	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter Tube	---	---	---	---	---	0.1*	0.003
Lead	AS-145	Filter	ND	---	---	---	---	0.05	3
Total Dust	AS-142	Filter	-0.01	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Sampling Site: Well 01083

Date of Collection: 12 May 1989  
Date of Analysis: 15, 16, 17 May and 5 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	---	Filter	---	---	---	---	---	0.01	0.2
Arsine	AS-043	CT	0.05	95	10.7	0.005	0.0009	0.2	0.02
Aldrin	AS-042	Filter	ND	111	172	---	---	0.25	0.003
Dieldrin	AS-042	Filter	ND	111	172	---	---	0.25	0.006
Dicyclopentadiene	AS-042	Filter	ND	111	172	---	---	30	0.2
Hexachlorocyclopentadiene	AS-044F AS-044T	Filter Tube	ND ND	95 95	9 9	---	---	0.1*	0.003
Lead	AS-041	Filter	ND	115	235	---	---	0.05	3
Total Dust	AS-045	Filter	0.02 mg	70	130	0.154	0.024	15	0.01

Equivalent exposure for mixture of compounds = 0.0353

ND = Parameter not detected

\*ACGIH time-weighted average



Sampling Site: M-01503

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 1 June 1989

Date of Analysis: 5, 6, 7 and 14 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-105	Filter	ND	155	307	---	---	0.01	0.2
Arsine	AS-102	CT	ND	80	8.3	---	---	0.2	0.02
	AS-112	CT	ND	80	8.3	---	---		
Aldrin	AS-103	Filter	ND	80	122	---	---	0.25	0.003
	AS-113	Filter	ND	80	122	---	---		
Dieldrin	AS-103	Filter	0.0032	80	122	0.026	0.004	0.25	0.006
	AS-113	Filter	ND	80	122	---	---		
Dicyclopentadiene	AS-103	Filter	ND	80	122	---	---	30	0.2
	AS-113	Filter	ND						
Hexachlorocyclopentadiene	AS-104F	Filter	ND	155	306	---	---	0.1*	0.003
	AS-104T	Tube	ND	155	306	---	---		
Lead	AS-106	Filter	ND	155	306	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = 0.104

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: M-01503: Field Blank

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 1 June 1989

Date of Analysis: 5, 6, 7 and 14 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-110	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-107	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-108	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-108	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	AS-108	Filter	ND	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	AS-109F AS-109T	Filter Tube	ND ND	---	---	---	---	0.1*	0.003
Lead	AS-111	Filter	ND	---	---	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: Boring 001, M-1 Pond

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 24 May 1989

Date of Analysis: 25, 27, 28, 31 May and 5 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m <sup>3</sup>	8-hr TWA mg/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>	Limit of Detection (ug)
Arsenic Trioxide	AS-093	Filter	ND	95	191	---	---	0.01	0.2
Arsine	AS-092	CT	ND	86	9.02	---	---	0.2	0.02
Aldrin	AS-095	Filter	ND	86	132.5	---	---	0.25	0.003
Dieldrin	AS-095	Filter	ND	86	132.5	---	---	0.25	0.006
Dicyclopentadiene	AS-095	Filter	ND	86	132.5	---	---	30	0.2
Hexachlorocyclopentadiene	AS-091F	Filter	ND	86	8.77	---	---	0.1*	0.003
	AS-091T	Tube	ND	86	8.77	---	---	---	---
Lead	AS-094	Filter	ND	95	191	---	---	0.05	3
Total Dust	AS-090	Filter	0.02 mg	70	124.5	0.161	0.023	15	0.01

Equivalent exposure for mixture of compounds = 0.0107

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: Borling 001, M-1 Pond: Field Blank

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 24 May 1989

Date of Analysis: 25, 27, 28, 31 May and 5 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-099	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-098	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-101	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-101	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	AS-101	Filter	ND	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	AS-097F	Filter	ND	---	---	---	---	0.1*	0.003
	AS-097T	Tube	ND	---	---	---	---		
Lead	AS-100	Filter	ND	---	---	---	---	0.05	3
Total Dust	AS-096	Filter	-0.01	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: BORING 007, M-1 POND

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 22 May 1989

Date of Analysis: 23, 24, 27, 28 May and 2 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-078	Filter	0.1	78	160	0.0006	0.0001	0.01	0.2
Arsine	AS-082	CT	ND	78	8.034	---	---	0.2	0.02
Aldrin	AS-080	Filter	ND	78	117.1	---	---	0.25	0.003
Dieldrin	AS-080	Filter	ND	78	17.1	---	---	0.25	0.006
Dicyclopentadiene	AS-080	Filter	ND	78	117.1	---	---	30	0.2
Hexachlorocyclopentadiene	AS-083F	Filter	ND	78	8.034	---	---	0.1*	0.003
	AS-083T	Tube	ND	78	8.034	---	---	---	---
Lead	AS-079	Filter	ND	78	159.1	---	---	0.05	3
Total Dust	AS-081	Filter	0.03 mg	69	121.8	0.246	0.035	15	0.01

Equivalent exposure for mixture of compounds = 0.0764

ND = Parameter not detected

\*ACGIH time-weighted average

Sampling Site: BORING 007, M-1 Pond: Field Blank Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 22 May 1989  
Date of Analysis: 23, 24, 27, 28 May and 2 June 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-084	Filter	ND	---	---	---	---	0.01	0.2
Arsine	AS-088	CT	ND	---	---	---	---	0.2	0.02
Aldrin	AS-086	Filter	ND	---	---	---	---	0.25	0.003
Dieldrin	AS-086	Filter	ND	---	---	---	---	0.25	0.006
Dicyclopentadiene	AS-086	Filter	ND	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	AS-089F AS-089T	Filter Tube	ND ND	---	---	---	---	0.1*	0.003
Lead	AS-085	Filter	ND	---	---	---	---	0.05	3
Total Dust	AS-087	Filter	ND	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Sampling Site: North Boundary M-1 Basin

Date of Collection: 2 May 1989

Date of Analysis: 17 May 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-002	Filter	ND	111	227	---	---	0.01	0.2
Arsine	---	CT	---	---	---	---	---	0.2	0.02
Aldrin	---	Filter	---	---	---	---	---	0.25	0.003
Dieldrin	---	Filter	---	---	---	---	---	0.25	0.006
Dicyclopentadiene	---	Filter	---	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
Lead	AS-001	Filter	ND	128	258.8	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

**Sampling Site: Waste Trench, M-1 Pond**

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 8 May 1989

Date of Analysis: 10, 15, 16 and 17 May 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	AS-019	Filter	ND	73	148	---	---	0.01	0.2
Arsine	AS-016	CT	ND	30	3.3	---	---	0.2	0.02
	AS-021	CT	ND	25	2.8	---	---	---	---
Aldrin	AS-017	Filter	ND	55	85.1	---	---	0.25	0.003
Dieldrin	AS-017	Filter	ND	55	85.1	---	---	0.25	0.006
Dicyclopentadiene	AS-017	Filter	ND	55	85.1	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
	AS-015	Tube	ND	30	2.7	---	---	---	---
	AS-020	Tube	ND	25	2.2	---	---	---	---
Lead	AS-018	Filter	ND	73	148	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average



Sampling Site: Headspace Cement Mixer, M-1 Pond

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 8 May 1989

Date of Analysis: 10, 15, 16 and 17 May 1989

COMPOUND	Field Sample Number	Sample Type	Found ug/sample	Sample Time (min)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	OSHA PEL mg/m3	Limit of Detection (ug)
Arsenic Trioxide	---	Filter	---	---	---	---	---	0.01	0.2
Arsine	AS-024	CT	ND	10	10	---	---	0.2	0.02
	AS-027	CT	ND	10	10	---	---	---	---
Aldrin	---	Filter	---	---	---	---	---	0.25	0.003
Dieldrin	---	Filter	---	---	---	---	---	0.25	0.006
Dicyclopentadiene	---	Filter	---	---	---	---	---	30	0.2
Hexachlorocyclopentadiene	---	Filter	---	---	---	---	---	0.1*	0.003
	AS-025	Tube	ND	10	0.53	---	---	---	---
	AS-026	Tube	ND	10	0.53	---	---	---	---
Lead	---	Filter	---	---	---	---	---	0.05	3
Total Dust	---	Filter	---	---	---	---	---	15	0.01

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*ACGIH time-weighted average

**Sampling Site: M-1 Pond Cement Mixer Headspace**

Sample Collected by: Daniel Burgess  
Sample Analysis by: DataChem

Date of Collection: 8 May1989  
Date of Analysis: 27 June1989

COMPOUND	Field Sample Number	Sample Type	Found** ug/sample	Sample Time (sec)	Volume of Air (L)	Found mg/m3	8-hr TWA mg/m3	Limit of Detection (mg)
GC Scan	AS-022	Tedlar Bag	ND	40	1.47	---	---	0.1
	AS-023	Tedlar Bag	ND	35	1.18	---	---	

Equivalent exposure for mixture of compounds = ND

ND = Parameter not detected

\*\*Analytical results are invalid due to the length of holding time (7 weeks) prior to chemical analysis

**APPENDIX C**  
**SAMPLE COLLECTION SUMMARY TABLE**

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# Sample Collection Summary

Sample Type	Section	Location Number	Number of Samples	Sample Type	Matrix	Sample Numbers	Sample Date	Sample Depth (ft) or Water Level ((ft) from ground surface)	Analytes
Trench	36-17N	T01	2	Sample	Waste	WC36NT01-W001	4/24/89	10.0	GCMS Volatiles GCMS Semivolatiles Organochlorine Pestic Organosulfur Compound Thiodiglycol DIMP/DMMP Arsenic Mercury ICP Metals DBCP Fluoroacetic Acid IMPA/MPA Moisture
				Rinsate	Water	WC36NT01-W003	4/24/89		
		T02	1	Sample	Waste	WC36NT02-W001	4/25/89	3.5	
		T03	1	Sample	Waste	WC36NT03-W001	4/25/89	4.5	
		T04	2	Sample	Waste	WC36NT04-W001	4/26/89	6.0	
				Rinsate	Water	WC36NT04-W003	4/26/89		
		T05	2	Sample	Waste	WC36NT05-W001	5/4/89	5.0	
				Rinsate	Water	WC36NT05-W003	5/4/89		
		T06	2	Sample	Waste	WC36NT06-W001	5/4/89	3.5	
				Rinsate	Water	WC36NT06-W003	5/4/89		
		T07	0						
		T07B	1	Sample	Waste	WC36NT07-W001	5/3/89	8.0	
		T08	0						
		T09A	2	Sample	Waste	WC36NT09-W001	4/27/89	2.5	
				Rinsate	Water	WC36NT09-W003	4/27/89		
		T10	1	Sample	Waste	WC36NT10-W001	5/1/89	2.5	
		T11	2	Sample	Waste	WC36NT11-W001	4/27/89	5.0	
Duplicate	Waste			WC36NT11-W002	4/27/89				
T12	0								
T13	1	Sample	Waste	WC36NT13-W001	4/28/89	7.0			
T14D	3	Sample	Waste	WC36NT14-W001	5/1/89	8.0			
		Duplicate	Waste	WC36NT14-W002	5/1/89				
		Rinsate	Water	WC36NT14-W003	5/1/89				
T15	1	Sample	Waste	WC36NT15-W001	5/9/89	5.0			
T16	2	Sample	Waste	WC36NT16-W001	5/9/89	4.0			
		Rinsate	Water	WC36NT17-W003	5/9/89				
T17	0								

All samples of the waste matrix were cleared for army agents by the Army lab before shipment.

Well	36-17N	36080	2	Sample	Water	WC36N080-G001	5/1/89	16.0	GCMS Volatiles GCMS Semivolatiles Organochlorine Pestic Organosulfur Compound Thiodiglycol DIMP/DMMP Arsenic Mercury ICP Metals DBCP Fluoroacetic Acid IMPA/MPA
				Rinsate	Water	WC36N080-G003	5/1/89		
		36084	2	Sample	Water	WC36N084-G001	4/25/89	6.6	
				Rinsate	Water	WC36N084-G003	4/25/89		
		36085	2	Sample	Water	WC36N085-G001	5/2/89	1.0	
				Rinsate	Water	WC36N085-G003	5/1/89		
		36088	2	Sample	Water	WC36N088-G001	4/28/89	16.0	
				Rinsate	Water	WC36N088-G003	4/28/89		
		36180	1	Sample	Water	WC36N180-G001	4/28/89	8.0	
		36187	1	Sample	Water	WC36N187-G001	6/8/89	14.8	

	36188	2	Sample Rinsate	Water Water	WC36N188-G001 WC36N188-G003	6/7/89 6/7/89	12.0	
	36189	3	Sample Duplicate Field Blank	Water Water Water	WC36N189-G001 WC36N189-G002 WC36N189-G005	6/7/89 6/7/89 6/7/89	11.2	
	36191	2	Sample Rinsate	Water Water	WC36N191-G001 WC36N191-G003	6/12/89 6/12/89	32.1	
	36192	4	Sample Duplicate Rinsate Field Blank	Water Water Water Water	WC36N192-G001 WC36N192-G002 WC36N192-G003 WC36N192-G005	6/13/89 6/13/89 6/13/89 6/13/89	45.8	
36-17S	36067	3	Sample Duplicate Rinsate	Water Water Water	WC36S067-G001 WC36S067-G002 WC36S067-G003	4/27/89 4/27/89 4/27/89	6.9	GCMS Volatiles GCMS Semivolatiles Organochlorine Pestic Organosulfur Compound Thiodiglycol DIMP/DMMP Arsenic Mercury ICP Metals DBCP Fluoroacetic Acid IMPA/MPA
	36075	2	Sample Rinsate	Water Water	WC36S075-G001 WC36S075-G003	4/18/89 4/18/89	9.9	
		2	Sample Rinsate	Water Water	WC36S075-G011 WC36S075-G013	6/2/89 6/2/89	9.5	
		2	Sample Rinsate	Water Water	WC36S075-G021 WC36S075-G023	6/6/89 6/6/89	9.4	
		2	Sample Rinsate	Water Water	WC36S075-G031 WC36S075-G033	6/15/89 6/15/89		
	36087	1	Sample	Water	WC36S087-G001	4/27/89	10.7	
	36190	2	Sample Rinsate	Water Water	WC36S190-G001 WC36S190-G003	6/6/89 6/5/89	9.1	
		4	Sample Duplicate Rinsate Rinsate	Water Water Water Water	WC36S190-G011 WC36S190-G012 WC36S190-G013 WC36S190-G023	6/15/89 6/15/89 6/15/89 6/15/89		
	36590	2	Sample Rinsate	Water Water	WC36S590-G001 WC36S590-G003	4/26/89 4/26/89	10.51	
	36591	1	Sample	Water	WC36S591-G001	4/26/89	2.4	
	36593	1	Sample	Water	WC36S593-G001	4/25/89	18.5	
M-1	01077	3	Sample Duplicate Field Blank	Water Water Water	WCM-1077-G001 WCM-1077-G002 WCM-1007-G005	6/2/89 6/2/89 6/2/89	Not Available	Total Arsenic Dissolved Arsenic Total Mercury Dissolved Mercury
	01083	1	Sample	Water	WCM-1083-G001	6/13/89	7.2	
	01503	2	Sample Rinsate	Water Water	WCM-1503-G001 WCM-1503-G003	6/2/89 6/1/89	7.3	
	01504	3	Sample	Water	WCM-1504-G001	5/31/89	7.5	
			Rinsate Fltr Rnst	Water Water	WCM-1504-G003 WCM-1504-G006	5/3/89 5/3/89		Total Arsenic & Mercu Dissolved Arsenic & M
	01524	1	Sample	Water	WCM-1524-G001	5/25/89	5.3	Total Arsenic Dissolved Arsenic Total Mercury Dissolved Mercury
	36001	1	Sample	Water	WC36S001-G001	5/5/89	11.7	
	36193	See Section 36-4 Well Samples						
36-4	36001	1	Sample	Water	WC36L001-G001	6/7/89	11.4	GCMS Volatiles

		36054	3	Sample Duplicate Rinsate	Water Water Water	WC36L054-G001 WC36L054-G002 WC36L054-G003	6/13/89 6/13/89 6/13/89	8.1		GCMS Semivolatiles Organochlorine Pestic Organosulfur Compound Thiodiglycol DIMP/DMMP Total Arsenic Dissolved Arsenic Total Mercury Dissolved Mercury ICP Metals
		36055	2	Sample Field Blank	Water Water	WC36L055-G001 WC36L055-G005	6/13/89 6/13/89	10.9		
		36058	1	Sample	Water	WC36L058-G001	6/12/89	3.6		
		36076	1	Sample	Water	WC36L076-G001	6/14/89	13.4		
		36167	1	Sample	Water	WC36L167-G001	6/14/89	9.1		
		36193	1	Sample	Water	WC36L193-G001	6/7/89	8.8		
			1	Sample	Water	WC36L193-G011	6/15/89	8.8		
		36194	1	Sample	Water	WC36L194-G001	7/13/89	14.1		
ring	36-17N	T01	2	Sample Rinsate	Soil Water	WC36NT01-S151 WC36NT01-S003	5/22/89 5/22/89	19.9 to 20.9		GCMS Volatiles GCMS Semivolatiles Organochlorine Pestic Organosulfur Compound Thiodiglycol DIMP/DMMP Arsenic Mercury ICP Metals DBCP Fluoroacetic Acid IMPA/MPA Moisture
		T02	1	Sample	Soil	WC36NT02-S151	5/23/89	19.0 to 20.0		
		36187	3	Sample Sample Duplicate	Soil Soil Soil	WC36N187-S011 WC36N187-S041 WC36N187-S042	5/5/89 5/5/89 5/5/89	0 to 1 4 to 5 4 to 5		
		36188	3	Sample Duplicate Sample	Soil Soil Soil	WC36N188-S011 WC36N188-S012 WC36N188-S041	5/3/89 5/3/89 5/3/89	0 to 1 0 to 1 4 to 5		
		36189	4	Sample Sample Rinsate Rinsate	Soil Soil Water Water	WC36N189-S011 WC36N189-S041 WC36N189-S003 WC36N189-S013	4/28/89 4/28/89 4/28/89 4/28/89	0 to 1 4 to 5		
		36191	2	Sample Sample	Soil Denver	WC36N191-S041 WC36N191-S191	5/9/89 5/9/89	4 to 5 19 to 20.5		
		36192	4	Sample Sample Duplicate Rinsate	Soil Denver Denver Water	WC36N192-S041 WC36N192-S191 WC36N192-S192 WC36N192-S193	5/16/89 5/17/89 5/17/89 5/17/89	4 to 5 12.5 to 14.5 12.5 to 14.5		
	36-17S	36190	2	Sample Sample	Soil Soil	WC36N190-S011 WC36N190-S041	4/19/89 4/20/89	0 to 1 4 to 5		
M-1		001	4	Sample Sample Sample Sample Duplicate	Soil Soil Soil Soil Soil	WCM-1001-S001 WCM-1001-S021 WCM-1001-S041 WCM-1001-S071 WCM-1001-S042	5/24/89 5/24/89 5/24/89 5/24/89 5/24/89	0.3 to 0.8 2.4 to 2.9 4 to 6.5 9.5 to 10 4 to 6.5	Limited Suite * Limited Suite Expanded Suite ** Limited Suite Expanded Suite	
		002	4	Sample Sample Sample Sample	Soil Soil Soil Soil	WCM-1002-S001 WCM-1002-S021 WCM-1002-S041 WCM-1002-S071	6/8/89 6/8/89 6/8/89 6/8/89	0.5 to 1 2.5 to 3 4 to 5 9.5 to 10	Limited Suite Limited Suite Expanded Suite Limited Suite	
		003	4	Sample Sample Sample Duplicate	Soil Soil Soil Soil	WCM-1003-S021 WCM-1003-S041 WCM-1003-S071 WCM-1003-S072	5/30/89 5/30/89 5/30/89 5/30/89	2 to 2.5 4 to 5 9 to 10 9 to 10	Limited Suite Expanded Suite Limited Suite Limited Suite	
		004	4	Sample Sample Sample Rinsate	Soil Soil Soil Water	WCM-1004-S021 WCM-1004-S041 WCM-1004-S071 WCM-1004-S023	5/30/89 5/30/89 5/30/89 5/30/89	2.5 to 3 4 to 5 9 to 9.5	Limited Suite Expanded Suite Limited Suite Limited Suite	
		005	5	Sample	Soil	WCM-1005-S001	5/25/89	0 to 0.5	Limited Suite	

		Sample	Soil	WCH-1005-S021	5/25/89	2 to 2.5	Limited Suite
		Sample	Soil	WCH-1005-S041	5/25/89	4 to 5	Expanded Suite
		Sample	Soil	WCH-1005-S071	5/25/89	7.5 to 8	Limited Suite
		Duplicate	Soil	WCH-1005-S042	5/25/89	4 to 5	Expanded Suite
006	7	Sample	Waste	WCH-1006-W041	5/23/89	4 to 6.5	Expanded Suite
		Sample	Soil	WCH-1006-S071	5/23/89	8 to 8.5	Limited Suite
		Sample	Denver	WCH-1006-D191	5/23/89	19 to 20	Limited Suite
		Duplicate	Waste	WCH-1006-W042	5/23/89	4 to 6.5	Expanded Suite
		Duplicate	Denver	WCH-1006-D192	5/23/89	19 to 20	Limited Suite
		Rinsate	Water	WCH-1006-S073	5/23/89		Limited Suite
		Rinsate	Water	WCH-1006-D193	5/23/89		Limited Suite
007	2	Sample	Waste	WCH-1007-W041	5/22/89	7 to 8	Expanded Suite
		Sample	Soil	WCH-1007-S071	5/22/89	8.5 to 9.0	Limited Suite
008	2	Sample	Waste	WCH-1008-W041	5/25/89	4 to 5	Expanded Suite
		Rinsate	Water	WCH-1008-W043	5/25/89		Expanded Suite
01083	3	Sample	Soil	WCH-1083-S021	5/10/89	2.5 to 3	Limited Suite
		Sample	Soil	WCH-1083-S041	5/11/89	4 to 5.5	Expanded Suite
		Sample	Soil	WCH-1083-S071	5/11/89	7.5 to 8	Limited Suite
36193	4	Sample	Soil	WC36S193-S001	5/16/89	0.5 to 1	Limited Suite
		Sample	Soil	WC36S193-S041	5/16/89	4 to 5	Expanded Suite
		Sample	Soil	WC36S193-S121	5/16/89	10 to 11	Limited Suite
		Rinsate	Water	WC36S193-S123	5/16/89		Limited Suite

\* Limited Suite: GCMS Semivolatiles  
Arsenic  
Mercury

\*\* Expanded Suite: GCMS Volatiles  
GCMS Semivolatiles  
Organochlorine Pesticides  
Organosulfur Compounds  
Thiodiglycol  
DIMP/DMMP  
Arsenic  
Mercury  
ICP Metals  
Moisture

36-4	36194	5	Sample	Soil	WC36L194-S001	6/15/89	0 to 1	GCMS Volatiles
			Sample	Soil	WC36L194-S041	6/15/89	4 to 5	GCMS Semivolatiles
			Sample	Soil	WC36L194-S121	6/15/89	19 to 20	Organochlorine Pestic
			Duplicate	Soil	WC36L194-S042	6/15/89	4 to 5	Organosulfur Compound
			Rinsate	Water	WC36L194-S003	6/15/89		Thiodiglycol
								DIMP/DMMP
								Total Arsenic
								Dissolved Arsenic
								Total Mercury
								Dissolved Mercury
								ICP Metals
								Moisture
ISV	M-1	Within East Basin	5	Sample	Waste	WCH-11SV-W001	5/9/89	GCMS Volatiles
				Duplicate	Waste	WCH-11SV-W002	5/9/89	GCMS Semivolatiles
								Organochlorine Pestic
								Organosulfur Compound
								Thiodiglycol
								DIMP/DMMP
								Arsenic
								Mercury
								ICP Metals
								PCBs
								Dioxins
								Moisture
				Rinsate	Water	WCH-11SV-W003	5/8/89	GCMS Volatiles
				Rinsate	Water	WCH-11SV-W013	5/8/89	GCMS Semivolatiles
				Rinsate	Water	WCH-11SV-W023	5/8/89	Organochlorine Pestic
								Organosulfur Compound
								Thiodiglycol
	Composite	4	Sample	Soil	WCH-11SV-SA01	5/9/89		

Soil	Duplicate	Soil	WCH-11SV-SA02	5/9/89
Around	Sample	Soil	WCH-11SV-SB01	5/9/89
Basins	Duplicate	Soil	WCH-11SV-SB02	5/9/89

DIMP/DIMP
Arsenic
Mercury
ICP Metals
PCBs
Moisture

All samples of the waste matrix were cleared for army agents by the Army lab before shipment.



**APPENDIX D**  
**WASTE MATERIAL SUMMARY TABLE**

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WASTE MATERIAL INVENTORY  
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DRUM NUMBER	DATE OBTAINED	WASTE STORAGE OR STAGING AREA	TYPE OF WASTE	SAMPLE NO.	DATE OF SAMPLE(S)	DATE TO WASTE STORAGE	COC ?/ INITIATED (Y/N)	REMARKS
6063	4/4/89	WASTE STRG.	PPE			4/24/89	N	
6064	4/5/89	WASTE STRG.	PPE			4/24/89	N	
6065	4/5/89	WASTE STRG.	PPE			5/23/89	N	
6069	4/14/89	WASTE STRG.	PPE			4/24/89	N	
6070	4/14/89	WASTE STRG.	EMPTY			6/16/89	Y	
6071	4/14/89	WASTE STRG.	PPE			4/24/89	N	
13001	4/14/89	WASTE STRG.	PPE			4/24/89	N	
13002	4/14/89	WASTE STRG.	PPE			4/24/89	N	
13003	4/17/89	WASTE STRG.	PPE			4/24/89	N	
13004	4/17/89	WASTE STRG.	PPE			4/24/89	N	
13005	4/17/89	WASTE STRG.	PPE			5/11/89	N	
13006	4/17/89	WASTE STRG.	PPE			5/23/89	N	
13007	4/17/89	HOLE 36-190	SOIL	WC36S190-S011	4/19/89	6/12/89	Y	
13008	4/17/89	WASTE STRG.	PPE	WC36S190-S041	4/20/89	5/23/89	N	
13009	4/17/89	WASTE STRG.	PPE			5/1/89	N	
13010	4/17/89	WASTE STRG.	PPE			5/1/89	N	
13011	4/17/89	WASTE STRG.	PPE			8/4/89	Y	5/8 INCH HOSE
13012	4/17/89	WASTE STRG.	PPE			4/24/89	N	
13013	4/19/89	WASTE STRG.	PPE			5/1/89	N	
13014	4/19/89	HOLE 36-190	SOIL	WC36S190-S011	4/19/89	6/12/89	Y	
13015	4/19/89	WASTE STRG.	PPE	WC36S190-S041	4/20/89	5/23/89	N	
13016	4/19/89	WASTE STRG.	PPE			5/11/89	N	
13017	4/19/89	WASTE STRG.	PPE			5/1/89	N	

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13018	4/19/89	WASTE STRG.	PPE			5/1/89	N	
13019	4/19/89	WASTE STRG.	PPE			4/24/89	N	
13020	4/19/89	WASTE STRG.	PPE			5/1/89	N	
13021	4/24/89	WASTE STRG.	PPE			5/1/89	N	
13022	4/24/89	BORING 36-191	SOIL	WC36N191-S041	5/9/89	6/13/89	Y	
				WC36N191-S191	5/9/89			
13023	4/24/89	BORING 36-192	SOIL	WC36N192-S041	5/16/89	6/15/89	Y	
				WC36N192-S191	5/17/89			
13024	4/24/89	BORING 36-190	SOIL	WC36S190-S011	4/19/89	6/12/89	Y	
				WC36S190-S041	4/20/89			
13025	4/24/89	WASTE STRG.	EMPTY			8/4/89	Y	
13026	4/24/89	WASTE STRG.	PPE			5/1/89	N	
13027	4/24/89	WASTE STRG.	PPE			5/1/89	N	
13028	4/24/89	WASTE STRG.	EMPTY			6/16/89	Y	
13029	4/24/89	WASTE STRG.	PPE			5/11/89	N	
13030	4/24/89	WASTE STRG.	PPE			5/11/89	N	
13031	4/24/89	WASTE STRG.	PPE			6/21/89	Y	
13032	4/24/89	WASTE STRG.	PPE			5/11/89	N	
13033	4/24/89	BORING 36-189	SOIL	WC36N189-S011	4/28/89	6/13/89	Y	
				WC36N189-S041	4/28/89			
13034	4/24/89	WASTE STRG.	PPE			5/23/89	N	
13035	4/24/89	BORING 36-189	SOIL	WC36N189-S011	4/28/89	6/13/89	Y	
				WC36N189-S041	4/28/89			
13036	4/24/89	BORING 36-189	SOIL	WC36N189-S011	4/28/89	6/12/89	Y	WET BUT WILL PROBABLY PASS FILTER TEST
				WC36N189-S041	4/28/89			
13037	4/24/89	BORING 36-187	SOIL	WC36N187-S011	5/5/89	6/12/89	Y	
				WC36N187-S041	5/5/89			
13038	4/24/89	BORING 36-187	SOIL	WC36N187-S011	5/5/89	6/13/89	Y	
				WC36N187-S041	5/5/89			
13039	4/24/89	WASTE STRG.	PPE			5/11/89	N	
13040	4/24/89	TRENCH 1	SOIL	WC36NT01-S151	5/26/89	6/13/89	Y	
13041	4/28/89	WASTE STRG.	PPE			5/11/89	N	

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13042	4/28/89	BORING 36-187	SOIL	WC36N187-S011 WC36N187-S041	5/5/89 5/5/89	6/13/89	Y	
13043	4/28/89	WASTE STRG.	PPE			6/16/89	Y	
13044	4/28/89	M-1 TRENCH SOIL	SOIL			6/15/89	Y	SEE ISV SAMPLE
13045	4/28/89	BORING 36-188	SOIL	WC36N188-S011 WC36N188-S041	5/3/89 5/3/89	6/12/89	Y	
13046	4/28/89	WASTE STRG.	PPE			5/11/89	N	
13047	4/28/89	BORING 01-083	SOIL	WCM-1083-S021 WCM-1083-S041 WCM-1083-S071	5/10/89 5/11/89 5/11/89	6/15/89	Y	
13048	4/28/89	WASTE STRG.	PPE			5/23/89	N	
13049	4/28/89	WASTE STRG.	PPE			5/11/89	N	
13050	4/28/89	WASTE STRG.	PPE			5/11/89	N	
13051	5/1/89	WASTE STRG.	PPE			6/16/89	Y	
13052	5/1/89	WASTE STRG.	EMPTY			8/4/89	Y	
13053	5/1/89	WASTE STRG.	EMPTY			8/4/89	Y	
13054	5/1/89	WASTE STRG.	PPE & PLASTIC			6/12/89	Y	
13055	5/1/89	WASTE STRG.	PPE			5/23/89	Y	
13056	5/1/89	M-1 BASINS	SOIL	WCM-115V-SA01 WCM-115V-SA02	5/9/89 5/9/89		N	ISV SAMPLE AWAITING RETURN FROM DATACHEM
13057	5/1/89	M-1 BASINS	SOIL	WCM-115V-SB01 WCM-115V-SB02	5/9/89 5/9/89		N	ISV SAMPLE AWAITING RETURN FROM DATACHEM
13058	5/1/89	BORING 36-188	SOIL	WC36N188-S011 WC36N188-S041	5/3/89 5/3/89	6/13/89	Y	
13059	5/1/89	WASTE STRG.	PPE			5/23/89	N	
13060	5/1/89	BORING 36-188	SOIL	WC36N188-S011 WC36N188-S041	5/3/89	6/12/89	Y	
13061	5/8/89	WASTE STRG.	PPE			6/21/89	Y	
13062	5/8/89	WASTE STRG.	EMPTY			8/4/89	Y	
13063	5/8/89	WASTE STRG.	PPE			7/17/89	Y	
13064	5/8/89	WASTE STRG.	PPE			5/23/89	N	

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13065	5/8/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13066	5/8/89	WASTE STRG.	PPE			6/16/89	Y	
13067	5/8/89	WASTE STRG.	PPE			5/23/89	N	
13068	5/8/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13069	5/8/89	BORING 36-191	SOIL	WC36N191-S041 WC36N191-S191	5/9/89 5/9/89	6/13/89	Y	
13070	5/8/89	WASTE STRG.	PPE			5/23/89	N	
13071	5/8/89	WASTE STRG.	PPE			5/23/89	N	
13072	5/8/89	WASTE STRG.	EMPTY			8/4/89	Y	
13073	5/8/89	BORING 36-191	SOIL	WC36N191-S041 WC36N191-S191	5/9/89 5/9/89	6/13/89	Y	
13074	5/8/89	BORING 36-191	SOIL	WC36N191-S041 WC36N191-S191	5/9/89 5/9/89	6/13/89	Y	
13075	5/8/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13076	5/10/89	WASTE STRG.	EMPTY			6/16/89	Y	
13077	5/10/89	WASTE STRG.	EMPTY			8/4/89	Y	
13078	5/10/89	WASTE STRG.	PPE			6/21/89	Y	
13079	5/10/89	WASTE STRG.	PPE			5/23/89	N	
13080	5/10/89	BORING 36-191	SOIL	WC36N191-S041 WC36N191-S191	5/9/89 5/9/89	6/13/89	Y	
13081	5/10/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13082	5/10/89	WASTE STRG.	PPE			6/16/89	Y	
13083	5/10/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13084	5/10/89	BORING 36-191	SOIL	WC36N191-S041 WC36N191-S191	5/9/89 5/9/89	6/13/89	Y	
13085	5/10/89	WASTE STRG.	EMPTY			8/4/89	Y	
13086	5/10/89	WASTE STRG.	PPE			5/23/89	N	
13087	5/10/89	WASTE STRG.	PPE			5/23/89	N	

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13088	5/10/89	BORING 01-083	SOIL	WCM-1083-S021 WCM-1083-S041 WCM-1083-S071	5/10/89 5/11/89 5/11/89	6/15/89	Y	
13089	5/10/89	WASTE STRG.	EMPTY			6/21/89	Y	
13090	5/10/89	WASTE STRG.	PPE			5/23/89	N	
13091	5/10/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13092	5/10/89	BORING 36-192	SOIL	WC36N192-S041 WC36N192-S191	5/16/89 5/17/89	6/15/89	Y	
13093	5/10/89	WASTE STRG.	EMPTY			6/16/89	Y	
13094	5/10/89	WASTE STRG.	PPE			8/4/89	Y	5/8 INCH PUMP HOSE
13095	5/10/89	WASTE STRG.	PPE			6/16/89	Y	
13096	5/10/89	WASTE STRG.	EMPTY			8/4/89	Y	
13097	5/10/89	WASTE STRG.	EMPTY			6/16/89	Y	
13098	5/10/89	WASTE STRG.	PPE			5/23/89	N	
13099	5/10/89	WASTE STRG.	PPE			6/16/89	Y	
13100	5/10/89	WASTE STRG.	PPE			5/23/89	N	
13101	5/11/89	M-1 BORING 6	SOIL	WCM-1006-S071 WCM-1006-D191	5/23/89 5/23/89	6/15/89	Y	
13102	5/11/89	WASTE STRG.	PPE			5/23/89	N	
13103	5/11/89	WASTE STRG.	PPE			6/16/89	Y	
13104	5/11/89	BORING 01-083	SOIL	WCM-1083-S021 WCM-1083-S041 WCM-1083-S071	5/10/89 5/11/89 5/11/89	6/15/89	Y	
13105	5/11/89	WASTE STRG.	PPE			6/16/89	Y	
13106	5/11/89	BORING 36-193	SOIL	WC36S193-S001 WC36S193-S041 WC36S193-S121	5/16/89 5/16/89 5/16/89	6/15/89	Y	
13107	5/11/89	WASTE STRG.	PPE			6/16/89	Y	
13108	5/11/89	WASTE STRG.	EMPTY			6/21/89	Y	
13109	5/11/89	WASTE STRG.	EMPTY			8/4/89	Y	

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13177	6/5/89	WASTE STRG.	PPE			8/4/89	Y	
13178	6/5/89	WASTE STRG.	PPE			8/4/89	Y	5/8 INCH PUMP HOSE
13179	6/5/89	WASTE STRG.	PPE			6/16/89	Y	
13180	6/5/89	WASTE STRG.	EMPTY			6/16/89	Y	
13181	6/5/89	WASTE STRG.	EMPTY			6/21/89	Y	
13182	6/5/89	WASTE STRG.	PPE			6/16/89	Y	
13183	6/5/89	M-1 BORING 2	SOIL	WCM-1002-S001 WCM-1002-S021 WCM-1002-S041 WCM-1002-S071	6/8/89	6/15/89	Y	
13184	6/5/89	WASTE STRG.	PPE			6/16/89	Y	
13185	6/5/89	WASTE STRG.	EMPTY			8/4/89	Y	

SOIL SAMPLES LISTED WITH ORIGINAL SAMPLE LOCATION. DRUMS ARE IN STAGING AREA.

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13132	5/23/89	TRENCH 2	SOIL	WC36NT02-S151	5/23/89	6/13/89	Y	
13133	5/23/89	WASTE STRG.	PPE			8/4/89	Y	
13134	5/23/89	WASTE STRG.	PPE			8/4/89	Y	5/8 INCH PUMP HOSE
13135	5/23/89	M-1 BORING 6	SOIL	WCM-1006-S071	5/23/89	6/15/89	Y	
13136	5/23/89	M-1 BORING 6	SOIL	WCM-1006-D191	5/23/89	6/15/89	Y	
13137	5/23/89	WASTE STRG.	PPE	WCM-1006-S071	5/23/89	6/16/89	Y	
13138	5/23/89	WASTE STRG.	EMPTY	WCM-1006-D191	5/23/89	8/4/89	Y	
13139	5/23/89	WASTE STRG.	EMPTY			7/10/89	Y	
13140	5/23/89	WASTE STRG.	PPE			6/16/89	Y	PLUS PLASTIC
13141	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13142	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13143	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13144	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13145	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13146	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13147	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13148	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13149	5/24/89	WASTE STRG.	PPE			6/16/89	Y	
13150	5/24/89	WASTE STRG.	PPE			6/16/89	Y	PLUS PLASTIC
13151	5/24/89	M-1 BORING 8	SOIL	WCM-1008-S071	5/25/89	6/15/89	Y	
13152	5/24/89	M-1 BORING 5	SOIL	WCM-1005-S071	5/25/89	6/15/89	Y	
				WCM-1005-S001	5/25/89			
				WCM-1005-S021	5/25/89			
				WCM-1005-S041	5/25/89			
13153	5/24/89	WASTE STRG.	EMPTY			6/16/89	Y	
13154	5/24/89	BORING 36-194	SOIL	WCM36L194-S001	6/15/89	6/21/89	Y	

07-Aug-89 date



WASTE MATERIAL INVENTORY  
WCC RMA TASK 2  
FINAL REPORT 8/7/89

DRUM NUMBER	DATE OBTAINED	WASTE STORAGE OR STAGING AREA	TYPE OF WASTE	SAMPLE NO.	DATE OF SAMPLE(S)	DATE TO WASTE STORAGE INITIATED (Y/M)	CDC 7/ WASTE STORAGE INITIATED (Y/M)	REMARKS
				WCM36L194-S041 WCM36L194-S121				
13155	5/24/89	WASTE STRG.	PPE			8/4/89	Y	
13156	5/24/89	WASTE STRG.	EMPTY			6/16/89	Y	
13157	5/24/89	WASTE STRG.	EMPTY			6/21/89	Y	
13158	5/24/89	WASTE STRG.	EMPTY			6/21/89	Y	
13159	5/24/89	WASTE STRG.	EMPTY			6/16/89	Y	
13160	5/24/89	M-1 BORING 3	SOIL	WCM-1003-S021 WCM-1003-S041	5/30/89	6/15/89	Y	
13161	5/30/89	M-1 BORING 4	SOIL	WCM-1004-S021 WCM-1004-S041 WCM-1004-S071	5/30/89 5/30/89 5/30/89	6/15/89	Y	
13162	5/30/89	WASTE STRG.	EMPTY			6/16/89	Y	
13163	5/30/89	WASTE STRG.	PPE			6/16/89	Y	
13164	5/30/89	WASTE STRG.	EMPTY			6/16/89	Y	
13165	5/30/89	WASTE STRG.	EMPTY			6/21/89	Y	
13166	5/30/89	WASTE STRG.	EMPTY			6/16/89	Y	AT 36192 6/6
13167	5/30/89	WASTE STRG.	EMPTY			6/16/89	Y	
13168	5/36/89	WASTE STRG.	EMPTY			6/21/89	Y	AT 36192 6/6
13169	5/30/89	WASTE STRG.	PPE			6/16/89	Y	
13170	5/30/89	WASTE STRG.	PPE			6/21/89	Y	
13171	6/5/89	WASTE STRG.	PPE			6/16/89	Y	
13172	6/5/89	WASTE STRG.	EMPTY			6/16/89	Y	
13173	6/5/89	WASTE STRG.	PPE			6/16/89	Y	
13174	6/5/89	BORING 36-194	SOIL	WCM36L194-S001 WCM36L194-S041 WCM36L194-S121	6/15/89	6/21/89	Y	
13175	6/5/89	WASTE STRG.	EMPTY			6/16/89	Y	
13176	6/5/89	WASTE STRG.	EMPTY			6/16/89	Y	

07-Aug-89 date

WASTE MATERIAL INVENTORY  
WCC RMA TASK 2  
FINAL REPORT 8/7/89

DRUM NUMBER	DATE OBTAINED	WASTE STORAGE OR STAGING AREA	TYPE OF WASTE	SAMPLE NO.	DATE OF SAMPLE(S)	DATE TO WASTE STORAGE	COC ?/ INITIATED (Y/N)	REMARKS
13110	5/11/89	BORING 36-193	SOIL	WC36S193-S001 WC36S193-S041 WC36S193-S121	5/16/89 5/16/89 5/16/89	6/15/89	Y	
13111	5/16/89	WASTE STRG.	EMPTY			5/23/89	Y	HOLE IN WALL OF DRUM, RETURN TO WESTON
13112	5/16/89	BORING 36-194	SOIL	WC36L194-S001 WC36L194-S041 WC36L194-S121	6/15/89	6/21/89	Y	
13113	5/16/89	BORING 36-192	SOIL	WC36M192-S041 WC36M192-S191	5/16/89 5/17/89	6/15/89	Y	
13114	5/16/89	WASTE STRG.	PPE			6/16/89	Y	
13115	5/16/89	BORING 36-192	SOIL	WC36M192-S041 WC36M192-S191	5/16/89 5/17/89	6/15/89	Y	
13116	5/16/89	BORING 36-192	SOIL	WC36M192-S041 WC36M192-S191	5/16/89 5/17/89	6/15/89	Y	
13117	5/16/89	BORING 36-192	SOIL	WC36M192-S041 WC36M192-S191	5/16/89 5/17/89	6/15/89	Y	
13118	5/16/89	BORING 36-193	SOIL	WC36S193-S001 WC36S193-S041 WC36S193-S121	5/16/89 5/16/89 5/16/89	8/7/89	Y	
13119	5/16/89	WASTE STRG.	PPE			5/23/89	N	
13120	5/16/89	WASTE STRG.	PPE			6/16/89	Y	
13121	5/16/89	BORING 36-192	SOIL	WC36M192-S041 WC36M192-S191	5/16/89 5/17/89	6/15/89	Y	
13122	5/16/89	WASTE STRG.	PPE			6/16/89	Y	
13123	5/16/89	WASTE STRG.	EMPTY			6/16/89	Y	
13124	5/16/89	M-1 BORING 7	SOIL	WCM-1007-S071	5/22/89	6/15/89	Y	
13125	5/16/89	WASTE STRG.	EMPTY			8/7/89	Y	
13126	5/16/89	WASTE STRG.	PPE			6/16/89	Y	
13127	5/16/89	WASTE STRG.	PPE			6/21/89	Y	
13128	5/16/89	WASTE STRG.	EMPTY			8/4/89	Y	
13129	5/16/89	WASTE STRG.	EMPTY			6/16/89	Y	
13130	5/16/89	WASTE STRG.	PPE			6/16/89	Y	
13131	5/23/89	WASTE STRG.	EMPTY			8/4/89	Y	

07-Aug-89 date

**APPENDIX E**  
**BORING LOGS**

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11

Edward-Clyde Consultants



PROJECT NAME Rocky Mountain Test #2

HOLE NO. 36-187

ING LOCATION <u>Sic 36-17</u>		ELEVATION AND DATUM	
ING AGENCY <u>Datum Exploration Inc</u>	DRILLER <u>Tony Rodriguez</u>	DATE STARTED <u>5/5/89</u> / <u>5/8/89</u>	
EQUIPMENT <u>CME 750</u>		COMPLETION DEPTH <u>22.2'</u>	SAMPLER <u>3" OD Split Spoon</u> w/ Polyline
LINE METHOD <u>Hollow stem Auger</u>	DRILL BIT <u>6 3/8" OD</u> CUTTER <u>Heud</u>	NO. OF SAMPLES	DIST. <u>9</u>
AND TYPE OF CASING <u>4" Schedule 40 PVC</u>		WATER ELEV.	FIRST <u>24 HRS.</u>
OF PERFORATION <u>1010 (No 10) slotted</u>	FROM <u>11</u> TO <u>21</u> FT.	LOGGED BY <u>Bob Wilson</u>	CHECKED BY
AND TYPE OF PACK <u>Colorado #10-20</u>	FROM <u>8.5</u> TO <u>22.2</u> FT.		
OF SEAL <u>Bentonite Pellets</u>	FROM <u>3.5</u> TO <u>8.5</u> FT.		

DESCRIPTION	GRAPHIC LOG		Water Content	Pistonage Data	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Piezometer Installation			Type No	Recon L	Penetration Resist. (lb/in <sup>2</sup> 6 in)	
sandy Silt - brown, black, abundant roots, damp, loose (OL)								Drillers + Geologist wearing level B/E protection.
silty Sand - yellowish brown, with occasional reddish brown clay inclusions, dry, loose (sm)								HNu readings are not above background unless noted. Background reading are 0-.2 ppm
silty Sand - as above....								
silty Sand - <sup>light</sup> yellowish brown, yellow, loose, dry, fine grain (sm)								
silty Sand - as above, with reddish brown hard clay inclusions (sm-sc)								
Silty Sand - dark yellow brown, very fine grain, trace clay, damp-moist, mod dense-loose (ML)								


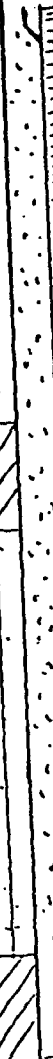
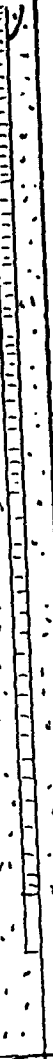




JECT NO. 22238B

SHEET 1 OF 3



DEPTH (feet)	DESCRIPTION	GRAPHIC LOG		Water Content	Penetration Dye	SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Indication			Type No.	Recovery	Moist Blow (6 in)		
11.5	silty Sand to a sandy Silt-as above....., moist, stiff- mod dense (mL)									
12.5	as above .....									
13.5	silty Sand-as above..... clayey, very moist (mL)									
14.5	No recovery									
15.5	silty Sand-yellowish brown, very fine grain, wet, loose (Sm-mL)									
16.5										
17.5										
18.5										
19.5										
20.5										
21.5										
22.5										
23.5										
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98.5										
99.5										
100.5										

The shoe did not hold the sample from 13' to 14'. This is because it was a saturated very fine sand. Free water at 13'.

DESCRIPTION	GRAPHIC LOG			SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
	Lithology	Planimeter Installation	Water Content	Planimeter Data	Type No.	Recon. (1)	Recon. (2)	
<p>10' 0" silty Sand as above....</p> <p>10' 0" clayey silt - yellowish brown, with trace very fine grain sand, trace dark brown clayey inclusions, moist, stiff (ML)</p> <p>10' 0" silty Sand - yellowish brown, fine grain, wet, loose (SM)</p> <p>10' 0" clayey silt - yellowish brown, with hard tan silty clay inclusions (ML)</p> <p>10' 0" Boring terminated at 22.2'</p>								<p>The hole was over drilled with a 10" auger (10 5/8" cutter head) after boring the 6" augers were pulled</p>

Woodward-Clyde Consultants PROJECT NAME <sup>BAC SAMPLE</sup> Rocky Mountain Arsenal Test 2 HOLE NO. 36-188

DRILLING LOCATION <u>Sec. 36-17</u>		ELEVATION AND DATUM	
DRILLING AGENCY <u>Datum Exploration Inc.</u>	DRILLER	DATE STARTED <u>5/13/84</u>	DATE FINISHED <u>5/14/84</u>
EQUIPMENT <u>CME 750</u>		COMPLETION DEPTH <u>23.5</u>	SAMPLER <u>3" OD Split Spoon</u> <sup>with polybutylene liner</sup>
DRILLING METHOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 5/8" Cutter Head</u>	NO. OF SAMPLES	UNDIST. <u>10</u>
SIZE AND TYPE OF CASING <u>4" Schedule PVC</u>		WATER ELEV.	FIRST COMPL. <u>24 HRS.</u>
SIZE OF PERFORATION <u>.010" (No. 10) slotted</u>	FROM <u>10.9</u> TO <u>20.9</u> FT.	LOGGED BY <u>Bob Wilson</u>	
SIZE AND TYPE OF PACK <u>Calorucka #10-20</u>	FROM <u>8.5</u> TO <u>22.2</u> FT.	CHECKED BY	
SIZE OF SEAL <u>Bentonite Pellets</u>	FROM <u>3.5</u> TO <u>8.5</u> FT.		

DEPTH FEET	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
		Lithology	Plazometer Indication	Water Depth	Pressure Depth	Type No.	Depth	Penetration Resistance (lb/in <sup>2</sup> )	Depth (ft)	
0	sandy Silt - black abundant roots + organic matter loose, dry - damp (OL)									Driller's and geologist in level B/C protective clothing.
1	silty Sand - tan, yellow/brown, fine grain, occasionally clayey, loose, dry (SM)									H/Nu readings 0 (background) unless noted
2										
3										
4										
5										
6										
7	silty Sand - as above . . . .									
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PROJECT NO. 22238 B

SHEET 1 OF 3







DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity	Date	SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
	Lithology	Piezometer Installation				Type No.	Recon. No.	Depth (ft)	Depth (in)	
ilt, wet, loose (SP)								7.0	ABG	
silty Sand - yellowish brown, very fine - fine grain, with trace clay as red inclusions (veins & clasts), wet, loose (SM)								7.5	ABG	
ilt, Sand as above ...										
grey silt - grayish brown with reddish brown clayey inclusions, trace fine gravel, damp - dry, mod dense - dense										
ring terminated at 23.5'										

Edward Clyde Consultants PROJECT NAME Rocky Mountain Arsenal Task 2 HOLE NO. 36-189

HOLE LOCATION <u>Sec 36-17</u>		ELEVATION AND DATUM	
DRILLING AGENCY <u>Datum Exploration Inc</u>	DRILLER <u>Russ Porter</u>	DATE STARTED <u>4/28/89</u>	DATE FINISHED <u>5/2/89</u>
DRILL EQUIPMENT <u>CME 750</u>		COMPLETION DEPTH <u>22.5</u>	SAMPLER <u>B</u>
DRILL METHOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 1/8" OD cutter</u>	NO. OF SAMPLES	DIST.
AND TYPE OF CASING <u>4" Schedule 40 PVC</u>		WATER ELEV.	FIRST COMPL. <u>124 HRS.</u>
LOG OF PERFORMANCE <u>.010" (No. 10) Slotted</u>	FROM <u>11</u> TO <u>21</u> FT.	LOGGED BY <u>Bob Wilson</u>	
AND TYPE OF PACK <u>Colorado #10 - #20</u>	FROM <u>8.0</u> TO <u>22.5</u> FT.	CHECKED BY	
OF SEAL <u>Bestonite Pellets</u>	FROM <u>3.5</u> TO <u>8.0</u> FT.		

DESCRIPTION	GRAPHIC LOG			SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Placerometer Installation	Water Content	Plasticity	Type No	Recovery Percent (100% = 6 in.)	
Sand - tan, yellow/brown, fine-very fine grain, subrounded, trace silt and clay, dry, loose (ML)			14 H2O				Drillers and Geologists in Respirators/Compression air
clayey Sand - tan, yellow/brown, fine-very fine grain, moist, loose (SC)							HNU B.G.O - 0.2 ppm
clayey silty Sand - tan, yellow/brown very fine-fine grain, dry, loose-moderate dense (SC-SM)			14 H2O				HNU reading 150 ppm
							M43, Dräger Jm18 readings 0
silty Sand - as above .... occasionally grades to a clayey silt (SM)							
silty Sand - yellow/brown, fine grain, trace clay, with occ black silty inclusions, dry - slightly moist, loose (SM)							HNU reading 5 ppm
sandy Silt - yellow/brown, with occasional fine to very fine							

ECT NO. 22238B

SHEET 1 OF 4


Edward-Clyde Consultants PROJECT NAME RMA Task 2 HOLE NO. 36-189

HOLE LOCATION Sec 36-17		ELEVATION AND DATUM	
DRILLING AGENCY Datum Exploration Inc	DRILLER Russ Porter	DATE STARTED 4/28/89 /	
INSTRUMENT CM E 750		COMPLETION DEPTH 22.5	SAMPLER
DRILL METHOD Hollow stem Auger	DRILL BIT 6 5/8" OD	NO. OF SAMPLES	DIST. 9
AND TYPE OF CASING 4" Schedule PVC		WATER ELEV.	FIRST
OF PERFORATION .010" (No. 10) slot	FROM 11 TO 21 FT.	LOGGED BY Bob Wilson	
AND TYPE OF PACK Colorado #10-#20	FROM 8.0 TO 22.5 FT.	CHECKED BY	
OF SEAL Bentonite Pellets	FROM 3.5 TO 8.0 FT.		







DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	Date	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Plasticity Index				Type No	Penetration (lb/in)	Moisture (lb/in)	
sand grains, trace clay, (ML)									
silty sand - as above ... (SM)									HN reading 0
silty clay - yellow/brown, orange/brown, trace very fine grain sand, firm (CL)									
clayey silt - yellow/brown, with occasional fine grain sand, wet, firm (ML)									Free water @ 10'
clayey silt - as above, with <del>occasional</del> fine gravel, wet, firm-stiff (ML)									
silty clayey Gravel - yellow brown, ag, occasional tan silt inclusions									

IT NO. 22238B

SHEET 2 OF 4

ard-Clyde Consultants  PROJECT NAME RMA Task 2 HOLE NO. 36-189

LOCATION <u>Sec 36-17</u>		ELEVATION AND DATUM	
SENDER <u>Datum Exploration Inc.</u>	DRILLER <u>Russ Parker</u>	DATE STARTED <u>4/28/89</u>	DATE FINISHED <u>5/1/89</u>
JIP <u>CME 750</u>		COMPLETION DEPTH <u>22.5</u>	SAMPLER
THOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 5/8" OD</u>	NO. OF SAMPLES	DIST. <u>9</u>
TYPE OF CASING <u>4" Schedule PVC</u>		WATER ELEV.	FIRST
FORMATION <u>.010" (No. 10) slotted</u>	FROM <u>11</u> TO <u>21</u> FT.	LOGGED BY <u>Bob Wilson</u>	
TYPE OF PACK <u>Colorado #10-#20</u>	FROM <u>8.0</u> TO <u>22.5</u> FT.	CHECKED BY	
<u>Bentonite Pellets</u>	FROM <u>3.5</u> TO <u>8.0</u> FT.		

DESCRIPTION	GRAPHIC LOG		Water Content	Piston	Date	SAMPLES			REMARKS (Drill Rate, Fluid loss, Oder, etc.)
	Lithology	Piezometer Installation				Type No	Recovery	Penetration (Blows/6 in)	
fine-medium grain sand, wet, nod dense-dense (Gm)									
fine clayey gravel - as above... (Gm-GC)									
gray gravel grades to a gravelly loess occasionally									
gray silty gravel - as above (Gm-GC)									
clayey Clay - yellow/brown, red, orange/brown, with trace silt, stiff - stiff (CH)									
clay - yellow/brown, orange/ stiff - hard, damp-moist (CL)									

We attempted a 4.5' run with the sampler from 15.5' to 20 and got a very poor sample ~75% recovery

22238 B

ward-Clyde Consultants



PROJECT NAME RMA Test 2

HOLE NO. 36-189

LOCATION Sec. 36-17		ELEVATION AND DATUM	
AGENCY Dartum Exploration Inc	DRILLER Russ Parker	DATE STARTED 4/28/89 / 5/2/89	
EQUIPMENT CME 750		COMPLETION DEPTH 22.5	SAMPLER
LOG JO Hollow Stem Auger	DRILL BIT 6 1/2" OD cutting head	NO. OF SAMPLES	DIST. UNDIST. 9
0 TYPE OF CASING 4" Schedule 1 PVC		WATER ELEV.	FIRST COMPL. 24 HRS.
PERFORATION .010" (No. 10) Slotted	FROM 11 TO 21 FT.	LOGGED BY	CHECKED BY
1 TYPE OF PACK Colorado #10-#20	FROM 8.0 TO 22.5 FT.	Bob Wilson	
SEAL Bentonite Pellets	FROM 3.5 TO 8.0 FT.		

DESCRIPTION	GRAPHIC LOG			Pneum. Date	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Piezometer Installation	Water Content		Type No.	Recovery	Pore Pressure (Bar/ft)	
silty clay - as above....								

Edward Clyde Consultants



PROJECT NAME

Rocky Mountain Arsenal

WELL NAME

Task 2 HOLE NO. 36-190

①

HOLE LOCATION		Sec 36-12		ELEVATION AND DATUM	
DRILLING AGENCY		Datum Exploration, Inc.		DATE STARTED 4/19/89	
DRILLER		Russ Parker		DATE FINISHED 4/26/89	
EQUIPMENT		CME 750		COMPLETION DEPTH 20 ft	
DRILL METHOD		Hollow Stem Auger		SAMPLER Bob Wilson	
DRILL BIT		6 5/8" OD		NO. OF SAMPLES	
AND TYPE OF CASING		4" PVC (Schedule 40)		DIST. 9	
OF PERFORATION		.010" (No. 10) Slotted		WATER ELEV. FIRST 7.5	
AND TYPE OF PACK		Colorado No. 10		COMPL. 6.8' 24 HRS.	
E OF SEAL		Bentonite Pellets		LOGGED BY Bob Wilson	
		FROM 8.25 TO 18.25 FT.		CHECKED BY	
		FROM 6.5 TO 20 FT.			
		FROM 3.0 TO 6.5 FT.			

DESCRIPTION	GRAPHIC LOG		Water Content	Piston	Dist	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Plazometer Installation				Type	Recon.	Penetration Resist. (lb/in. 6 in)	
Sand - tan to brown, fine grained, medium to well sorted, loose, dry (SP)									Drill crew: geologist, health and safety Tech in respirators, compressed air
very silty Clay - firm, brown, with some fine grain sand, low plasticity (CL)									H <sub>Np</sub> background reading 0.4-0.5 ppm prior to drilling
silty Sand yellow, yellow brown, fine grain, very loose, dry (SP) (SM)									H <sub>Np</sub> reading 0
at 6.8' soil becomes moist									

JECT NO. 22238B

SHEET 1 OF 3

Edward-Clyde Consultants PROJECT NAME RMA Task #2 HOLE NO. 36-190

LOCATION <u>Sec 36-17</u>		ELEVATION AND DATUM	
AGENCY <u>Datum Exploration Inc</u>	DRILLER <u>Russ Parker</u>	DATE STARTED <u>4/9/89</u>	DATE FINISHED <u>4/26/89</u>
DRILLING EQUIPMENT <u>CME 250</u>		COMPLETION DEPTH <u>20 ft</u>	SAMPLER <u>Rob Wilson</u>
METHOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 1/8" CO CUTTER HEAD</u>	NO. OF SAMPLES	DIST. <u>9</u>
TYPE OF CASING <u>4" Schedule 40 PVC</u>	WATER ELEV. <u>7.5</u>	FIRST	COMPL. <u>6.8</u> 24 HRS.
PERFORATION <u>.010" (No 10) slotted</u>	FROM <u>8.25</u> TO <u>18.35</u> FT.	LOGGED BY <u>Bob Wilson</u>	
TYPE OF PACK <u>Colorado Nub</u>	FROM <u>6.5</u> TO <u>2.0</u> FT.	CHECKED BY	
SEAL <u>Bentonite Pellets</u>	FROM <u>3</u> TO <u>6.5</u> FT.		

DESCRIPTION	GRAPHIC LOG		WATER CONTENT	PIEZOMETER DATA	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Piezometer Installation			Type No	Recovery	Penetration (lb/ft <sup>2</sup> / 6 in)	
very silty sand-yellow, yellow brown, fine grain, occasionally grading to slightly clayey silt, with red and black silt inclusions, wet (SP-MC)								HNu reading 5ppm
very silty sand-orange, yellow orange, fine grain, with occasional fine gray gravel, grades to a sandy silt at times, mod loose-poorly compacted. (SP-SM)								HNu reading 1.5ppm
very silty sand-orange, yellow orange, fine grains, with red silt inclusions, trace fine gray gravel @ 19' gravelly sand as above... (SP)								The hole was overdrilled with a 10" auger after completion depth was reached. The PVC casing was then set inside the 10" auger  HNu Reading 0 over background

IE T NO. 22238B

SHEET 3 OF 3



BORING LOCATION		ELEVATION AND DATUM	
Sec. 36-17			
DRILLING AGENCY	DRILLER	DATE STARTED	DATE FINISHED
Datum Exploration Inc		5/8/89	5/11/89
DRILLING EQUIPMENT		COMPLETION DEPTH	SAMPLER
CME 250		40'	3" OD Spts. w/ Poly bag
DRILLING METHOD	DRILL BIT	NO. OF SAMPLES	DIST.
Hollow Stem Auger	6-1/2" OD Cutter Head		
SIZE AND TYPE OF CASING		WATER ELEV.	FIRST
4" Schedule 40 PVC			
TYPE OF PERFORATION	FROM	TO	LOGGED BY
.010" (No 10) slotted	27.5	37.5	Bob Wilson
SIZE AND TYPE OF PACK	FROM	TO	CHECKED BY
Colorado #10-20	21.9		
TYPE OF SEAL	FROM	TO	
Bentonite Pellets	16	21.9	

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES			REMARKS (Drill Run, Fluid loss, Odor, etc.)
		Lithology	Plazometer penetration	Water Content	Plazometer Data	TYPE NO.	REMARKS	REMARKS	
1	silty Sand - yellowish brown, very fine to occasionally fine grain, with roots, dry, loose (OL-SM)								Drillers & Geologist in level C/B Protective clothing
2	silty Sand - as above without roots (SM)								HNp readings background (0.2 ppm) unless noted
3									The boring was overdrilled with a 10" auger (10 5/8" cutter head) after the 6" augers were removed. The monitoring well was then installed through the 10" augers
4	silty Sand - yellowish brown, fine-very fine grain, sub rounded, occasional roots, dry, loose (ML-SM)								
5									
6	silty Sand - yellowish brown, very fine to occasional fine grain, sub rounded, loose to mod dense when silt content increases slightly, dry (ML-SM)								
7									





DEPTH (feet)	DESCRIPTION	GRAPHIC LOG			SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Piezometer Installation	Water Content	Plasticity Index	Type No.	Depth (ft)	
7								
8	silty Sand - orangish brown, yellowish brown, very fine grain, grades to a sandy silt in part, dry, loose - firm as a silt. (ML)							
9								
10	as above . . . , trace dampness							
11								
12								
13	silty Sand - yellowish brown, very fine grain, trace tan hard clay inclusions (probable volcanics), dry, loose (ML)							
14								
15	silty Sand - as above . . .							
16								

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	Liquid Limit	Shrinkage Value	Swelling Pressure	SAMPLER Type	REMARKS (Drill Rate, Fluid loss, etc.)
		Lithology	Plasticity Index							
16										16.3' Denver forma- tion top.
17	Clay (volcanic ash) tan with reddish brown, green, and black inclusions, dry, firm - st. ff (CL)									
18	sandy Silt - orangeish brown, reddish brown, reddish orange, fine to occasional medium grain sand, trace fine gravel, dry, firm to soft (ML) at 17.5' tan clasts occur									
19	as above . . . , trace moisture with associated organic matter roots, dense - mod dense									
20										
21	sandy Silt - as above . . . (ML)									
22	sandy Silt - varicoloral (well ox- idized) trace roots, with red- dish very fine to fine grain sand clasts, dry, mod dense (ML - occ CL)									
23	sandy Silt - as above, trace fine gravel									
24	gravelly Silt - silty Gravel - yellowish brown, gray, fine gravel, mod dense dry									
25	Intabeddal clay (possible weathered shale) and silt. Clay - grayish brown, dark greenish gray									



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index			Type No.	Depth (ft)	Depth (ft)	
25	with reddish brown and brown oxidized veins, dry, hard - dense								This claystone is really a weath- ered shale
26	Shale - grayish brown to greenish gray, occasional brown vug fillings, interbedded with yellowish orange siltstone, dry, hard.								
27									
28	shale as above ...., trace moisture								
29									
30	shale - greenish gray to grayish brown, with yellowish brown interbedded siltstone, dry, hard								HN reading 2ppm over background
31									
32									
33	shale as above ....								
34									



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Wells Content	Pneumatics Data	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plummer Installation			Type no.	Depth ft.	Pressure Blow ft.	
34	shale - grayish brown to greenish gray, occasional banded with dark gray brown shale and yellowish brown silt, dry, hard								
35									
36									
37	shale as above ....								
38									
39									
39	shale - gray, grayish brown, with interbedded yellow orange silt, hard, dry								No water was detected in the hole while drilling. 16 hours after drilling 1.8' of water was detected in the hole. After overdrilling a water check indicated the hole was dry again
40	Boring terminated at 40.0'								









































PROJECT NAME Rocky

Mountain Arsenal Test #2

HOLE NO. 36-192

WELL LOCATION		Section 36-17		ELEVATION AND DATUM		5253.68	
DRILLING AGENCY		Datum Exploration Inc		DRILLER		Tang Rodriguez	
DRILLING EQUIPMENT		CME 750		DATE STARTED		5/16/89	
DRILLING METHOD		Hollow Stem Auger		DATE FINISHED		5/16/89	
SIZE AND TYPE OF CASING		4" OD Schedule 40 PVC		COMPLETION DEPTH		65'	
TYPE OF PERFORATION		10" (No 10) slotted		NO. OF SAMPLES		DIST.	
SIZE AND TYPE OF PACK		Colorado No 10 - #20		WATER ELEV.		FIRST	
TYPE OF SEAL		Bentonite Pellets		LOGGED BY		CHECKED BY	
		FROM 40 TO 45 FT		Bob Wilson			
		FROM 45 TO 65 FT		Dave Bufo			

D Feet	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation	Water Content	Piston Data	Type No.	Recon.	Penetration (lb./sq. ft.) (100 ft.) (6 in.)		
1	sandy Silt - black, dark brown, with roots, damp, loose (OL)			✓					grout	
1	clayey Silt - dark brown, trace roots, damp, soft-firm (ML)			✓						
				✓						
				✓						
				✓						
				✓						
				✓						
				✓						
				✓						
				✓						
4	as above ...			✓						
5	silty sand - medium yellowish brown, with occasional tan silty inclusions, (probable volcanic ash), dry, mod dense - loose (SM-ML)			✓						
				✓						
				✓						
				✓						
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				✓						

PROJECT NO. 22238B

SHEET 1 OF 8



ELEVATION	DESCRIPTION	GRAPHIC LOG		Water Content	Pneumometer	Date	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation				Type No.	Recon. II	Recon. I	
7										
8	silty Sand as above...									
9	clay (volcanic ash) - tan, with green and black mineral inclusions, dry, stiff (CL)									
10	Shale - very weathered, brown to dark brown, dry, hard, crumbly									
12	Shale - medium brown to dark brown, with reddish brown silty veins - clasts, dry, hard, blocky, crumbly (very weathered)									
13	Shale - brown to greyish brown, occasional layered with greenish gray shale, dry, hard, blocky, crumbly (very weathered)									
14										
15	Shale as above...									
16										

DEPTH (ft)	DESCRIPTION	GRAPHIC LOG			SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasma meter and test for log	Water Content	Plasma meter Depth	Type No	Depth (ft)	Depth (ft)	
16	Shale - brown to grayish brown, with greenish gray banded layers, dry, hard, crumbly.								
17									
18									
19	Shale as above with trace reddish orange to reddish brown staining in healed fractures, occasional reddish orange siltstone clasts								
20	Shale - brown, with black inclusions, hard, dry, crumbly.								
21	Shale - dark to medium brown, with some interbedded yellow brown siltstone, dry, hard, crumbly, weathered								
22									
23									
24									
25	shaley siltstone dark yellowish brown, with some brown								



DEPTH	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasma for metallography	Moist Content	Plasma for petrography	Type	Size	Depth	Weight	
25	interbedded shale, tr fine grain sand, dry, dense-very dense, mica inclusions, weathered									
25-25.9'	sandy siltstone dark yellow brown, dry, dense, breaks into plates in part.									
26	siltstone grading to a shale									
27	Shale-dark brown, clean, trace fine grain silty sand layers veins which have a slight trace of dampness, hard, dry									
28										Refusal drilling @ 28'. Pull sampler and drill with auger only.
30										
31	sample from unknown depth (probably from about 30') Sandstone-yellowish brown to tan, fine grain and medium to coarse grain (possible bimodal deposition), abundant dark mineral inclusions, very tight, very dense, dry									The sample came up the outside of the auger. The auger had about 2.5' of this sandstone as a plug
32										
33										Solid stem augers were used from 32.5 to completion depth
34										





DEPTH FEET	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Piezometer Installation	Water Content	Piezometer Depth	Type No.	Recon. No.	Probe Recoil Blow g/in.		
0	Shale: dark brown, clean, hard, dry, very weathered									
35	2s 2 bone									
6										
6										
7										
39	2s 2 bone									
10										
11										
12										
43										



Depth (ft)	DESCRIPTION	GRAPHIC LOG		Water Content	Piezometer Data	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Piezometer Installation			Type No.	Spec. #	Probe Resist Blow (6 ft)	
41	25 2 bone								Bentonite 421
15									
16									
4	Shale/claystone								
48									
49									sand pack
20	25 2 bone								
52									





DEPTH ft	DESCRIPTION	GRAPHIC LOG			WATER CONTENT	PNEUMATIC DATE	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasma Installation				Type No.	Recon. (1)	Recon. (2)	
53	25 2 bones									
54										
55										
56	Weathered Shale/claystone									
57										
58										
59										
60	25 2 bones									
61										



Woodward-Clyde Consultants PROJECT NAME RMA task 2 HOLE NO. 36193

DRILLING LOCATION <u>SECTION 36</u>		ELEVATION AND DATUM	
DRILLING AGENCY <u>Datum Exploration Inc.</u>	DRILLER <u>Bob Hollinger</u>	DATE STARTED <u>5-16-89</u>	DATE FINISHED <u>5-17-89</u>
DRILLING EQUIPMENT <u>CME 55</u>		COMPLETION DEPTH <u>19.0'</u>	SAMPLER <u>3" O.D. w/ polybutyrate liners</u>
DRILLING METHOD <u>Hollow stem auger</u>	DRILL BIT <u>6 5/8" gutter head</u>	NO. OF SAMPLES	DIST.
SIZE AND TYPE OF CASING <u>4" schedule 40 PVC</u>		WATER ELEV.	FIRST
TYPE OF PERFORATION <u>.010" (N. 10) slotted</u>	FROM <u>6.9</u> TO <u>15.7</u> FT.	LOGGED BY <u>STEVEN E. MORRISSETTE</u>	
SIZE AND TYPE OF PACK <u>SAND / Colorado #10-#20</u>	FROM <u>5.5</u> TO <u>19.0</u> FT.	CHECKED BY	
TYPE OF SEAL <u>Bentonite pellets</u>	FROM <u>0</u> TO <u>3.5</u> FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES		REMARKS (Drill Run, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation	Water Control	Piezometer Date	Type No.	Remarks (Depth, Pressure, etc.)	
1	SILTY CLAY, firm-stiff, low-plastic, organic, dusky yellowish-brown (10 yr 3/2), (ci), wet, roots					3" polybutyrate	1.2 feet	LEGEND: <div style="display: flex; justify-content: space-around;"> <div> - Cement/bentonite grout</div> <div> - Bentonite pellets</div> </div>
2	SILTY SAND, loose, fine-grained, well-sorted, subangular, dark yellowish-brown (10 yr 1/2 munsell), (sm), wet, roots							
3	Color changes to moderate yellowish-brown (10 yr 5/4 munsell), no roots							
4								
5								
6								
7								
8								
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PROJECT NO. 22238B

SHEET 1 OF 3



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index			Type No.	Size, in.	Perfor. Resist. (lb/in.)	
8									
7									
10	material becomes wetter								
11						3" polybutyrate	1.5 feet		Water level 13 days AD ▼ Water level 6 days AD ▼
12									
13									
14									
15									
16	SILTY SAND, loose, fine grained, well sorted, sub angular, grayish-brown (5 yr 3/2 munsell), very wet (sm) with lenses of pale orange (10 yr 8/2 munsell), SILTY CLAY which are 2-3" thick								



DEPTH FEET	DESCRIPTION	GRAPHIC LOG		Water Content	Moisture Content	SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index			Type No.	Flow No.	Flow No.	Flow No.	
6	SILTY SAND, loose, fine-grained, well-sorted, subangular, grayish-brown (5YR 7/2 munsell), very wet (SM) with lenses of pale orange (10YR 8/2 mm.), SILTY CLAY which are 2"-3" thick									
7										
8										
9										
10	CLAYSTONE, hard, dusky brown (5YR 2/2 munsell) CL									
11										
12	bottom of boring at 19.0'									
13										
14										
15										
16										
17										
18										
19										
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HNG LOCATION		SECTION 3h		ELEVATION AND DATUM	
1	AGENCY	DATUM EXPLOATION INC	DRILLER	DATE STARTED 6-15-89 / 6-16-89	
1	EQUIPMENT	CME SS / 6" hollow stem augers		DATE FINISHED	6-15-89 / 6-16-89
1	LOGGING METHOD	hollow stem augers	DRILL BIT	COMPLETION DEPTH	28.0' SAMPLES 3" I.D. Finers
1	LOG TYPE OF CASING	4" I.D. schedule 40 PVC	DRILL BIT	NO. OF SAMPLES	DIST. UNDIST. 3
1	PERFORATION	#10 slotted	FROM 23.0 TO 14.2 FT.	WATER ELEV.	FIRST 16.8' COMPL. 124 INCH.
1	AND TYPE OF PACK	#10-#20 bitumens sand	FROM 28.0 TO 9.0 FT.	LOGGED BY	CHECKED BY
1	SEAL	bentonite pellets	FROM 9.0 TO 4.0 FT.	STEVEN E. MORRISSETTE	

[illegible]





ELEVATION	DESCRIPTION	GRAPHIC LOG		Water Content	pH	Temperature	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Plasma/for Isotopology				Type No.	Depth (ft)	Depth (m)	
7	SAME AS ABOVE									
18										
7										
0										
12										
13										
4										
16										

material becomes  
much wetter at  
a depth of approx.  
12.5 feet.

Water level 21 hrs. AD





DEPTH FEET	DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	Date	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index				Type No.	Recon. No.	Notes Recon. No.	
16	Same as above									
17										
18										
19										
20	color changes to a moderate brown (5 yr 3/4 munsell)									
21										
22	SANDY SILTY CLAY, firm-stiff, pale yellowish-brown (10 yr 6 1/2 munsell), wet with gravel sized inclusions of dusky yellowish-brown (10 yr 7 1/2 munsell) weathered shale/claystone "bedrock"									
23										
24										
25										

water level  
ATD

STAINLESS STEEL  
CENTRALIZER WAS  
INSTALLED IN THE  
CENTER OF THE SCREEN  
AREA.

Driller notes that  
material becomes  
much stiffer from  
23 feet downward.



ELEVATION ft.	DESCRIPTION	GRAPHIC LOG		Water Content	Pneumometer Date	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Pneumometer Installation			Type No.	Recon. (1)	Recon. (2)	
25	SAME AS ABOVE								
26									
27	SILTY CLAY, very stiff, low-plastic, dusky brown (5 YR 2/2 munsell), slightly wet (CL), blocky  "WEATHERED BEDROCK" (SHALE or CLAYSTONE)								
28	bottom of boring at 28.0 ft.								
30									
31									
32									
33									
34									



DRILLING LOCATION <b>M-1 Ponds</b>				ELEVATION AND DATUM			
DRILLING AGENCY <b>Datum Exploration Inc.</b>				DATE STARTED <b>5-11-89 / 5-12-89</b>			
DRILLER <b>B.O. Hollinger</b>				DATE FINISHED			
DRILLING EQUIPMENT <b>CME 55</b>				COMPLETION DEPTH <b>18.75'</b>			
DRILLING METHOD <b>Hollow Stem Auger</b>				NO. OF SAMPLES			
DRILL BIT <b>6 5/8" auger</b>				DIST.			
SIZE AND TYPE OF CASING <b>4" Schedule 40 PVC</b>				WATER ELEV. <b>FIRST 11.5' COMPL 11.3' 24 HRS. 6.6</b>			
TYPE OF PERFORATION <b>.010" (No. 10) Slotted</b>				LOGGED BY <b>STEVEN E. MORRISSETTE</b>			
FROM <b>7.5'</b> TO <b>16.3'</b>				CHECKED BY			
SIZE AND TYPE OF PACK <b>SAND / Colorado #10 - #20</b>				FROM <b>6.0'</b> TO <b>18.0'</b>			
TYPE OF SEAL <b>Bentonite Pellets</b>				FROM <b>3.0'</b> TO <b>6.0'</b>			
				TO <b>18.75'</b>			

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation	Water Content	Piezometer Date	Type No.	Recon. No.	Packing (lb/ft)	Seal (lb/ft)	
1	SILTY SAND, loose, fine-grained, well-sorted, subangular, moderate yellowish-brown (10 yr S/4 munsell), slightly wet (sm)									LEGEND: - Cement/Bentonite grout - Bentonite pellets
2										
3										
4										
5	SANDY SILTY CLAY, firm, low-plastic, dusky brown (5 yr 2 1/2 munsell), very wet with fine-grained, well sorted, subangular sand (CL)									Note: Sample tube (6") taken from the 2.5-3.0 foot interval.
6	SILTY SAND, loose, fine-grained, well sorted, subangular, moderate brown (5 yr 3/4 munsell), very wet (sm)									
7										Water level 20 hrs. AD













DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Water Content	Piezometer Depth	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasma Installation			Type No.	Recon. (1)	Penet. Blow (6 in)	
7	color changes to moderate yellowish-brown (10 yr 5/4 munsell)..								← DEPTH OF SORTED SECTION BELOW GL. (7.5 feet) (top)
8						3" polybutyrate			
9									
10									
11									
12	SILTY SAND, loose, fine-grained, well sorted, subangular, moderate yellowish-brown (10 yr 5/4 munsell), very wet (sm) with 2"-3" layers of yellowish-gray (5 yr 8/1 munsell) to very light-gray (N8 munsell) soft silty clay material								
13									
14	SILTY SAND, loose, fine-med. grained, well-sorted, subangular, moderate brown (5 yr 8/4 munsell), very wet (sm)								
15									
16									



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index			Type	Size	Depth	Flow	
16	SILTY SAND, loose, fine-medium grained, well-sorted, subangular, moderate brown (5 YR 3/4 munsell), very wet (sm)									← DEPTH OF SUTTED SECTION BELOW G.L. (16.3 feet) (b.t.)
17	SILTSTONE, hard, medium gray (NS munsell), with some coarse grained sand and gravel inclusions. Upper foot is fractured with SILTY SAND matrix.									
18										
19	bottom of boring at 18.75'									
20										
21										
22										
23										
24										
25										



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Water Content	Piezometer Data	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation			Type No.	Recon. H.	Penetration Resist. Blow (6 in)	
19	same as above								
20									
21									
22	bottom of boring @ 22.0 ft.								
23									
24									
25									
26									
27									
28									

3" polybuty.

1.0 feet

Note: Soil in sampler  
tube from 20.9 ft to  
22.0 ft is saturated.Note: bottom of  
sampler shoe had free  
water in it at a  
depth of 22.0'.

Woodward-Clyde Consultants



PROJECT NAME

RMA task 2

HOLE NO.

TRENCH #2  
Soil boring

BORING LOCATION SECTION 36-17N anomaly area A		ELEVATION AND DATUM 5250.3	
DRILLING AGENCY DATUM EXPLORATION	DRILLER B. Hollinger	DATE STARTED	DATE FINISHED
		S-23-89	5-24-89
DRILLING EQUIPMENT CME SS / 6" hollow stem auger	COMPLETION DEPTH 20.0 ft.	SAMPLER 3" OB split spoon liners	
DRILLING METHOD Hollow stem augers	DRILL BIT 6 5/8" roller	NO. OF SAMPLES	DIST.
SIZE AND TYPE OF CASING	WATER ELEV. FIRST 19.5	UNDIST.	1
TYPE OF PERFORATION	FROM TO FT.	LOGGED BY	CHECKED BY
SIZE AND TYPE OF PACK	FROM TO FT.	STEVEN E.	
TYPE OF SEAL	FROM TO FT.	MORISSETTE	

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Plazometer Installation	Water Content	Piezometer Data	Type No.	Recovery	Penetration (lb/in.)	Grain Size (in.)	
3.0	boring begins at a depth of 3.5! Hole has 18" PVC casing from the surface to depth of 3.5 feet.									See trench log #2 for soil ID. above 3.5 feet.
4	SILTY SAND, loose, fine-grained, well sorted, subangular, moderate yellowish-brown (18 yr S/4 mun.), slightly wet (sm)									Note: Bob Hollinger dropped sampler approx. 2.5 ft. into soil. We believe this plugged the tip and caused only 50% recovery on the first 5.0 ft run.
5										
6										
7										
8										
9	some small lenses (1"-2") of pale yellowish-brown (10 yr 6/2) discoloration appear.									
10										

PROJECT NO. 22238B

SHEET 1 OF 3





DEPTH (feet)	DESCRIPTION	GRAPHIC LOG			Water Content	Plasticity Index	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index	Water Content			Type No.	Depth (ft)	Penetration (lb/in)	
10	same as above									
11										
12										
13										
14										
15	material becomes much wetter.									
16										
17										
18										
19	Same as above with lenses (2"-3") of SILTY CLAY, soft-firm, low plastic, very pale orange (10 yr 5/2) to grayish- orange (10 yr 7/4), very wet (CL)									

Woodward-Clyde Consultants

PROJECT NAME RMA task 2TRENCH #  
HOLE NO. Soil borin

ELEVATION (Feet)	DESCRIPTION	GRAPHIC LOG		Water Content	Moisture Ratio	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasticity Index			Type No.	Depth (ft)	Weight (lb)	
19	same as above					3" polybuck.	1.0 feet		Some free water in the bottom .5 feet of sample.
20	bottom of boring at 20.0ft								
21									
22									
23									
24									
25									
26									
27									
28									

PROJECT NO. 22238BSHEET 3 OF 3

Woodward-Clyde Consultants



PROJECT NAME Pack Mountain Arsenal Task 2 HOLE NO. 001

WCC-1

BORING LOCATION <u>M-1 Ponds</u>		ELEVATION AND DATUM <u>5264.0</u>	
DRILLING AGENCY <u>Datan Exploration Inc</u>	DRILLER <u>Russ Parker</u>	DATE STARTED <u>5/24/89</u>	
DRILLING EQUIPMENT <u>CME 250</u>		COMPLETION DEPTH <u>19.2</u>	SAMPLER <u>2" OD Split Spoon w/ polybuterate liners</u>
DRILLING METHOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 1/2" 60 Cutter Head</u>	NO. OF SAMPLES	DIST. <u>3</u>
SIZE AND TYPE OF CASING		WATER ELEV. <u>7.0</u>	COMPL. <u>NA</u> 24 HRS <u>NA</u>
TYPE OF PERFORATION	FROM TO FT.	LOGGED BY <u>Bob Wilson</u>	CHECKED BY
SIZE AND TYPE OF PACK	FROM TO FT.		
TYPE OF SEAL	FROM TO FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		WATER CONTENT	PIEZOMETER DATE	SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation			Type No.	Recon. No.	Recon. Date/Time	
1	Silty Sand - yellowish brown to yellowish gray, very fine to occasional fine grain, with pebbles, dry, mod dense (SM-ML)								
2	Silty sand - as above without pebbles, damp, loose-mod dense (ML)								
3									
4	GS above....								
5	clayey silt - dark brown, stiff, damp. (ML)								
6									
7									
									water level from moisture on sampled

PROJECT NO. 22238 B

SHEET 1 OF 2

Woodward-Clyde Consultants PROJECT NAME RAMA Task #2 HOLE NO. 36-190

HOLE LOCATION <u>Sec 36-12</u>		ELEVATION AND DATUM	
AGENCY <u>Datum Exploration Inc</u>	DRILLER <u>Russ Parker</u>	DATE STARTED <u>4/19/89</u>	DATE FINISHED <u>4/26/89</u>
DRILLING EQUIPMENT <u>CME 750</u>		COMPLETION DEPTH <u>20 ft</u>	SAMPLER <u>Bob Wilson</u>
DRILLING METHOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 5/8" OD cutter head</u>	NO. OF SAMPLES	DIST. <u>9</u>
AND TYPE OF CASING <u>4" Schedule 40 PVC</u>		WATER ELEV. <u>7.5</u>	COMPL. <u>6.8</u> 24 HRS.
TYPE OF PERFORATION <u>.010" (No 10) slotted</u>	FROM <u>8.25</u> TO <u>18.25</u> FT.	LOGGED BY <u>Bob Wilson</u>	CHECKED BY
AND TYPE OF PACK <u>Colorado No 10</u>	FROM <u>6.5</u> TO <u>20</u> FT.		
TYPE OF SEAL <u>Bentonite Pellets</u>	FROM <u>3.0</u> TO <u>6.5</u> FT.		

DEPTH	DESCRIPTION	GRAPHIC LOG				SAMPLES			REMARKS (Drill Run, Fluid loss, Oder, etc.)
		Lithology	Phreometer Installation	Water Control	Piezometer Data	TYPE NO	RECORD	Positive Reading (ft) (in)	
0	at 7.5' soil becomes wet								
1	black silty inclusions								1.0 A.B.G.
2	silty Sand as above...								
3									
4									
5									
6									
7									
8									
9									
10									Free water encountered @ 10'
11									H <sub>2</sub> O reading 0 over background
12									
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## RMA Task #2

HOLE NO. ~~89-001~~

Rfc

WCC-

HOLE NO. ~~89-001~~

PROJECT NO. 22238 R

SHEET 2 OF 2

Goodward-Clyde Consultants

PROJECT NAME RMA TASK NO. 2

HOLE NO. 21202

WCC-2

BIRING LOCATION <u>M-1 POND AREA, BORING LOCATION 01002</u>		ELEVATION AND DATUM <u>5263.4</u>	
ILLING AGENCY <u>DATUM EXPLORATION</u>		DRILLER <u>R. PARKER</u>	
EQUIPMENT <u>CME-750</u>		DATE STARTED <u>6-8-84</u> / <u>6-8-89</u>	
METHOD <u>6" DIA. H.S.A.</u>		COMPLETION DEPTH <u>10 FT.</u>	
DRILL BIT <u>63/24</u>		SAMPLER <u>POLY BUTYRATE</u>	
NO. OF SAMPLES		DIST. <u>4</u>	
WATER ELEV.		COMPL. <u>24 HRS.</u>	
PE OF PERFORATION		LOGGED BY <u>KLAAS DOEDEN</u>	
PE OF SEAL		CHECKED BY.	

DEPTH	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Plasticity	Water Content	Piezometer Data	Type No.	Recovery	Penetration	Grain Size	
0	LOOSE, NON-PLASTIC, DRY, BROWN TO REDDISH-BROWN, WELL SORTED, SANDY SILT WITH SOME CLAY.		USC	WL & PL						BORING ADVANCED WITH 6" DIA. H.S.A. WITH 6 3/8" DIA. CUTTING HEAD.
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PROJECT NO. 222-388-2120

SHEET 1 OF 2



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		Water Content	Plasticity Index	Date	SAMPLES			REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
		Lithology	Plasticity Index				Type No.	Number of Pieces	Weight (gms.)	
7	FIRM TO SOFT, LOW PLASTIC, WELL SORTED, BROWN TO REDDISH BROWN, VERY SILTY <u>CLAY</u> WITH TRACE OF SAND BECOMING LT. BROWN.		CL	NK V PL						
8	BECOMING BROWN TO REDDISH BROWN			NK V PL						
9										
10							3' Clay		BOTTOM OF BORING 10.0 FT.  BORING BACK-FILL TO GROUND SURFACE WITH GROUT	

Woodward-Clyde Consultants PROJECT NAME RMA task 2 HOLE NO. 3

BORING LOCATION <u>M-1 pond area</u>		ELEVATION AND DATUM <u>5261.6</u>	
DRILLING AGENCY <u>Datum Exploration Inc.</u>		DRILLER <u>T. L. Lutz</u>	
DRILLING EQUIPMENT <u>CME 750</u>		DATE STARTED <u>5-30-89</u>	
DRILLING METHOD <u>6" hollow stem</u>		DATE FINISHED <u>5-30-89</u>	
DRILL BIT <u>6 7/8" (cutting)</u>		COMPLETION DEPTH <u>10.5</u>	SAMPLER <u>3" I.D. Poly. 1/2 in.</u>
SIZE AND TYPE OF CASING		NO. OF SAMPLES	DIST.
TYPE OF PERFORATION		WATER ELEV.	UNDIST. <u>3</u>
SIZE AND TYPE OF PACK		FIRST <u>6.5'</u>	COMPL. <u>6.5'</u> 24 HRS. <u>N/A</u>
TYPE OF SEAL		LOGGED BY <u>STEVEN E. MORRISSETTE</u>	
		CHECKED BY	

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG		WATER	PISTON	DATE	SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plazometer				TYPE NO.	REMARKS	DATE	TIME	
0	SILTY SAND, loose, fine-grained, well-sorted, sub-angular, moderate brown (5 yr 3/4 munsell from 0.0' - 0.4'), moderate yellowish-brown (10 yr 5/4 munsell from 0.4' below), slightly wet, (5m)										roots from 0.0' - 0.4'
1											
2	becomes slightly wetter at 2.2'										Note: We hit a hard object at 1.5 feet. We believe it was just a chunk of concrete or a rock and continue drilling.
3	color change to dark yellowish-brown (10 yr 4 1/2 munsell) at a depth of 3.0'										
4											
5											
6											
7	SILTY SAND, same as above with some thin lenses of very pale orange (10 yr 8 1/2 munsell) silty clay material										soil is saturated from 6.5' to bottom of boring

PROJECT NO. 22238B

SHEET 1 OF 2





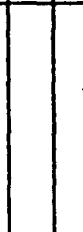

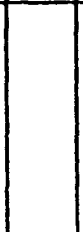

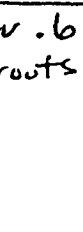


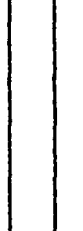
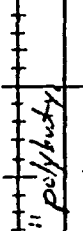
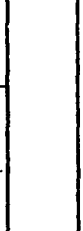




DEPTH FEET	DESCRIPTION	GRAPHIC LOG		WATER CONTENT	PERCENTAGE MOISTURE	DATE	SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Planes for Interpretation				Type No.	Sec. 1	Sec. 2	Sec. 3	
7	Same as above										
8	SILTY SAND, loose, fine-grained, well-sorted, subangular, moderate yellowish-brown (10 yr 5/4 mm.), very wet, (sm)						3" polybody.				
9											
10											
11	bottom of boring at 10.5 feet										boring grouted immediately after completion
12											
13											
14											
15											
16											

Woodward-Clyde Consultants  PROJECT NAME FMA task 2 <sup>nd</sup> <sup>WCC-7</sup> HOLE NO. 4

BORING LOCATION <u>M-1 pond area</u>				ELEVATION AND DATUM <u>5262.1</u>			
DRILLING AGENCY <u>DATUM EXPLORATION INC.</u> DRILLER <u>Russ Parker</u>				DATE STARTED <u>5-30-89</u>			
DRILLING EQUIPMENT <u>CME 750</u>				COMPLETION DEPTH <u>10.5'</u> SAMPLER <u>3" I.D. polybody</u>			
DRILLING METHOD <u>6" hollow stem</u> DRILL BIT <u>5/8" roller</u>				NO. OF SAMPLES		DIST.	
SIL AND TYPE OF CASING				WATER ELEV.		UNDIST. <u>3</u>	
TYPE OF PERFORATION				LOGGED BY		CHECKED BY	
SIZE AND TYPE OF PACK				STEVEN E.			
TYPE OF SEAL				MORRISSETTE			

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Piezometer Installation	Water Content	Piezometer Data	Type No.	Recovery	Penetration (BBQ) 6 in.		
0	SILTY SAND, loose, fine-grained, well-sorted, sub-angular, moderate yellowish-brown (10 yr 5/4 mussett), dry (sm)								upper .6 feet has roots.	
1										
2										
3										
4	becomes slightly wet at a depth of 3.8 feet.									
5										
6										
7										

PROJECT NO. 22238B

SHEET 1 OF 2

**C**

RMA task 2



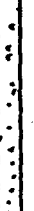

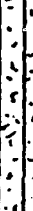




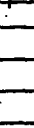


Rlc  
WCC-H  
HOLE NO. 4

[illegible]

Woodward-Clyde Consultants  PROJECT NAME: KMA task 2 HOLE NO. 5

BORING LOCATION <u>M-1 pond area</u>		ELEVATION AND DATUM <u>5263.5</u>	
DRILLING AGENCY <u>Datum Exploration Inc.</u> DRILLER <u>T. Rodriguez</u>		DATE STARTED <u>5-25-89</u> / <u>5-25-89</u>	
DRILLING EQUIPMENT <u>CME 750</u>		COMPLETION DEPTH <u>8.5 ft.</u> SAMPLER <u>3" I.D. P.I.P.</u>	
DRILLING METHOD <u>6" hollow stem</u> DRILL BIT <u>6 5/8" cutting</u>		NO. OF SAMPLES <u>4</u> DIST. <u>UNDIST.</u>	
SIZE AND TYPE OF CASING		WATER ELEV. <u>7.4'</u> COMPL. <u>24 HRS.</u>	
TYPE OF PERFORATION		LOGGED BY <u>STEVEN E. MORRISSETTE</u>	
SIZE AND TYPE OF PACK		CHECKED BY	
TYPE OF SEAL			

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Run, Fluid loss, Odor, etc.)						
		Lithology	Plasometer	Water Content	Plasticity	Type No.	Recon.	Penetration (lb/in)								
0	SILTY SAND, loose, fine-grained, well-sorted, sub-angular, dark yellowish-brown (10 yr 4 1/2 munsell), slightly wet, (sm)  color changes to very pale orange at (10 yr 8/2) depth of 1.5'-1.7'. color changes to moderate yellowish-brown (10 yr 5/4) at 1.7'-1.9'.					3" polyb. body.										
1																
2																
3	color change to dark yellowish-brown (10 yr 4 1/2 munsell) at a depth of 3.0 feet.					3" polyb. body.										
4																
5																
6	SILTY CLAY, firm-Stiff, low-plastic, dusky yellowish-brown (10 yr 2 1/2 munsell), wet (CL)					3" polyb. body.										
7																

PROJECT NO. 22238B

SHEET 1 OF 2

[illegible]

Edward Clyde Consultants

PROJECT NAME Rocky Mountain Arsenal Task #2 HOLE NO. MT-006

120 WCC-6

G LOCATION <u>M-1 Ponds</u>		ELEVATION AND DATUM <u>5262.4</u>	
ING AGENCY <u>Datum Exploration Inc.</u>	DRILLER <u>Russ Parker</u>	DATE STARTED <u>5/23/89</u>	DATE FINISHED <u>5/24/89</u>
ING EQUIPMENT <u>CME 750</u>	COMPLETION DEPTH <u>19.0'</u>	SAMPLER <u>3' OD split spoon</u> w/ poly buterote liner	
NO. <u>1</u> HOOD <u>Hollow Stem Auger</u>	DRILL BIT <u>6 1/2" OD cutter</u>	NO. OF SAMPLES <u>7</u>	DIST. <u>UNDIST.</u>
AND TYPE OF CASING	WATER ELEV. <u>7.5'</u>	FIRST <u>7.5'</u>	COMPL. <u>NA</u> 24 HRS. <u>NA</u>
OF PERFORATION	FROM TO FT.	LOGGED BY <u>Bob Wilson</u>	CHECKED BY
AND TYPE OF PACK	FROM TO FT.		
OF SEAL	FROM TO FT.		

DESCRIPTION	GRAPHIC LOG				SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Planimeter translation	Weight Content	Planimeter Date	Type No.	Recovery Percent (lb/ft) (6 in)		
silty Sand - dark yellowish brown, finegrain, with pebbles (medium gravel), dry, mod dense From .4' as above without pebbles, trace dampness (SM) becoming clayey (sc) soil + waste mixture - dense Waste - light gray with black veins, texture of a silty clay, damp to wet, soft Waste as above .... soil and waste mixture dense								Note if the augers were turned to fast the waste would turn to a semi- liquid

JECT NO. 222388SHEET 1 OF 3

Woodward-Clyde Consultants



PROJECT NAME

RMA Test #2

HOLE NO. ~~006~~

12-6

WCC-6

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG			SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Piezometer Installation	Water Content	Plasticity Data	Type No.	Depth Feet	Depth Feet	
7.5	Silty sand - dark yellowish brown, very fine to fine grain, loose, moist - wet. (see) (SM-ML)								Water @ 7.5'
8									
9									
10	as above								
11									
12	Silty sand - medium yellowish brown, occ grades to a sandy silt, fine to medium grain, wet, loose (SA)								
13									
14	Claystone (weathered shale) dark brown, dry, mod dense, crumbly - blocky								Denver formation @ 13.9'
15									
16									

PROJECT NO. 222388

SHEET 2 OF 3

Woodward-Clyde Consultants

PROJECT NAME RMA Task #2

L2C WCC-6

HOLE NO. MT-006

DEPTH FEET	DESCRIPTION	GRAPHIC LOG			SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Piezometer Installation	Water Content	Piezometer Depth	Type No.	Recon. To Depth (ft)	
16	Claystone (Weathered shale) as above							
17								
18								
19								
								Hole grouted to surface

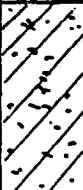
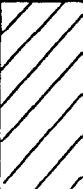
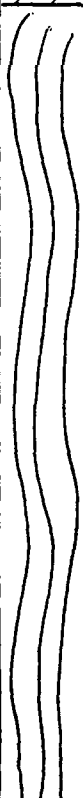
PROJECT NO. 22238 BSHEET 3 OF 3



KFC WCC-7

Howard-Clyde Consultants PROJECT NAME Rocky Mountain Arsenal Tank #2 HOLE NO. 007

LOCATION <u>M-1 Ponds</u>		ELEVATION AND DATUM <u>5264.0</u>	
AGENCY <u>Datum Exploration Inc.</u>	DRILLER <u>Tony Rodriguez</u>	DATE STARTED <u>5/22/89</u>	DATE FINISHED <u>5/22/89</u>
EQUIPMENT <u>CME 250</u>	COMPLETION DEPTH <u>9.5'</u>	SAMPLER <u>3" D. Split Spoon w/ Polyethylene liners</u>	
NO. <u>100</u>	DRILL BIT <u>6 3/4" ON head</u>	NO. OF SAMPLES <u>1</u>	DIST. <u>1</u>
TYPE OF CASING <u>Hollow stem Auger</u>	WATER ELEV. <u>9.0'</u>	UNDIST. <u>3</u>	COMPL. <u>NA</u> 24 HRS <u>NA</u>
PERFORMANCE	FROM TO FT.	LOGGED BY <u>Bob Wilson</u>	CHECKED BY
TYPE OF PACK	FROM TO FT.		
OF SEAL	FROM TO FT.		

DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
	Lithology	Piezometer Installation	Water Content	Piezometer Data	Type No.	Recovery	Particle Size (mm)	6 in.	
sandy Silt - dark yellowish brown with some pebbles and fine gravel, loose, dry (ML)									
clayey Silt - medium yellow brown, with some fine grain sand, trace dampness, stiff (ML)									
Waste - light gray to white with occasional black veins, consistency of silty clay, damp-moist, soft, possibly lime									
as above									at 5.5' the waste came out of the liner and was left in the hole. Sampler was run down the hole again and forced over the lost sample



DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG			SAMPLES			REMARKS (Drill Rate, Fluid loss, Odor, etc)
		Lithology	Plasma meter installation	Water Content	Plasma meter Data	Type No.	Recon. No.	
8	(Native soil) silty Sand - dark to medium yellowish brown, fine grain, with gray waste clastics, very dense.							
9	(Clean Native soil) silty Sand - dark to medium yellowish brown, fine grain, damp, mod. dense (SM)							
	Boring terminated at 9.5'							Hole grouted to surface
10								
11								

Woodward-Clyde Consultants



PROJECT NAME

RMA task 2

HOLE NO.

8

BORING LOCATION <b>M-1 pond area</b>		ELEVATION AND DATUM <b>5263.9</b>	
DRILLING AGENCY <b>DATUM EXPLORATION INC</b>		DRILLER <b>RUSS PARKER</b>	
DRILLING EQUIPMENT <b>CME 750</b>		DATE STARTED <b>5-25-89</b> / <b>5-25-89</b>	
DRILLING METHOD <b>6" hollow stem</b>		COMPLETION DEPTH <b>9.0'</b>	
DRILL BIT <b>6 5/8" cutting</b>		SAMPLER <b>3" I.D. poly body liner</b>	
NO. OF SAMPLES		DIST. <b>1</b>	
WATER ELEV.		UNDIST. <b>1</b>	
SIZE AND TYPE OF CASING		FIRST <b>N/A</b>	
TYPE OF PERFORATION		COMPL. <b>N/A</b> (24 HRS. <b>N/A</b> )	
SIZE AND TYPE OF PACK		LOGGED BY <b>STEVEN E. MORRISSETTE</b>	
TYPE OF SEAL		CHECKED BY	

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG				SAMPLES				REMARKS (Drill Rate, Fluid loss, Odor, etc.)
		Lithology	Placer material	Water Content	Pressure	Type No.	Recovery	Penetration	Recovery	
0	large gravel road fill. (3"-4")									Note: A 3"-4" layer of large gravel exists on the surface. Interspersed gravel was noted in the soil to a depth of 1.5'-2.0'.
1	SILTY SAND, loose, fine-grained, well sorted, subangular; moderate yellowish-brown (10 yr 5/4 munsell) very wet (sm)									
2										Note: Water standing on the surface enters the hole immediately. No water level was possible because of this.
3	Medium dark gray (N4) to light gray (N7), fine, with consistency of F silty clay									
4	same as above silty sand except color changes to dark yellowish-brown (10 yr 4/2 munsell)									
5										
6										
7										

PROJECT NO.

22238B

SHEET 1 OF 2



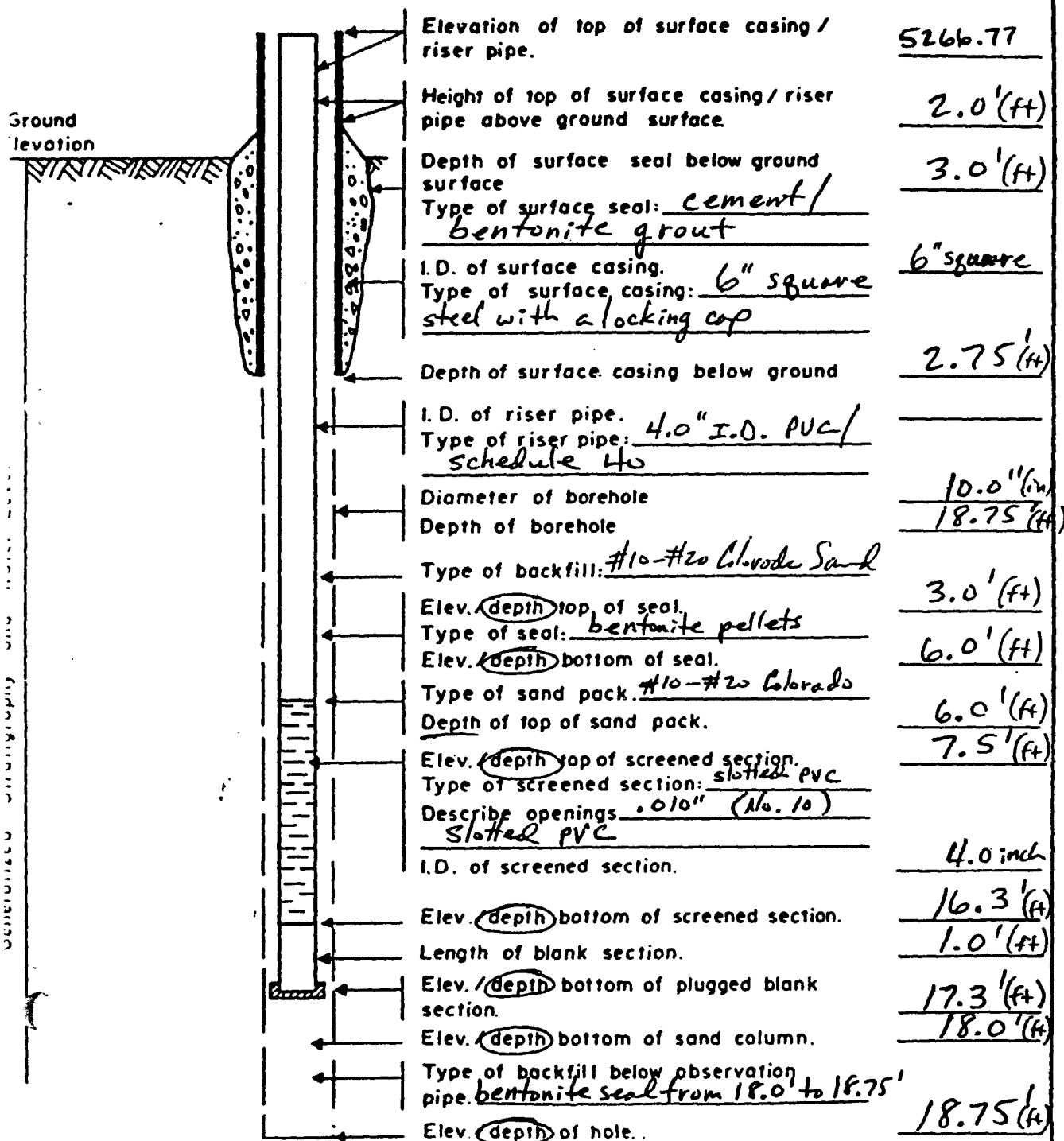
DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG			Pressure Content	Penetration Rate	SAMPLES			REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
		Lithology	Plasticity Index	Moisture Content			Type No.	Depth Feet	Depth Feet	
7	Same as above									
8										
9	bottom of boring at 9.0 feet									hole grouted in immediately after completion.
10										
11										
12										
13										
14										
15										
16										

**APPENDIX F**  
**GROUNDWATER OBSERVATION WELL REPORTS**

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# GROUND WATER OBSERVATION WELL REPORT

PROJECT <u>222386 RMA task 2</u>	Page <u>1</u> of <u>1</u>
LOCATION <u>M-1 pond area / RMA</u>	Well No. <u>01083</u>
Date Completed <u>5-12-89</u> Original Depth _____	Aquifer <u>alluvial</u>
Inspected By _____ Date _____	Depth Interval _____
Checked By _____ Date _____	



# GROUND WATER OBSERVATION WELL REPORT

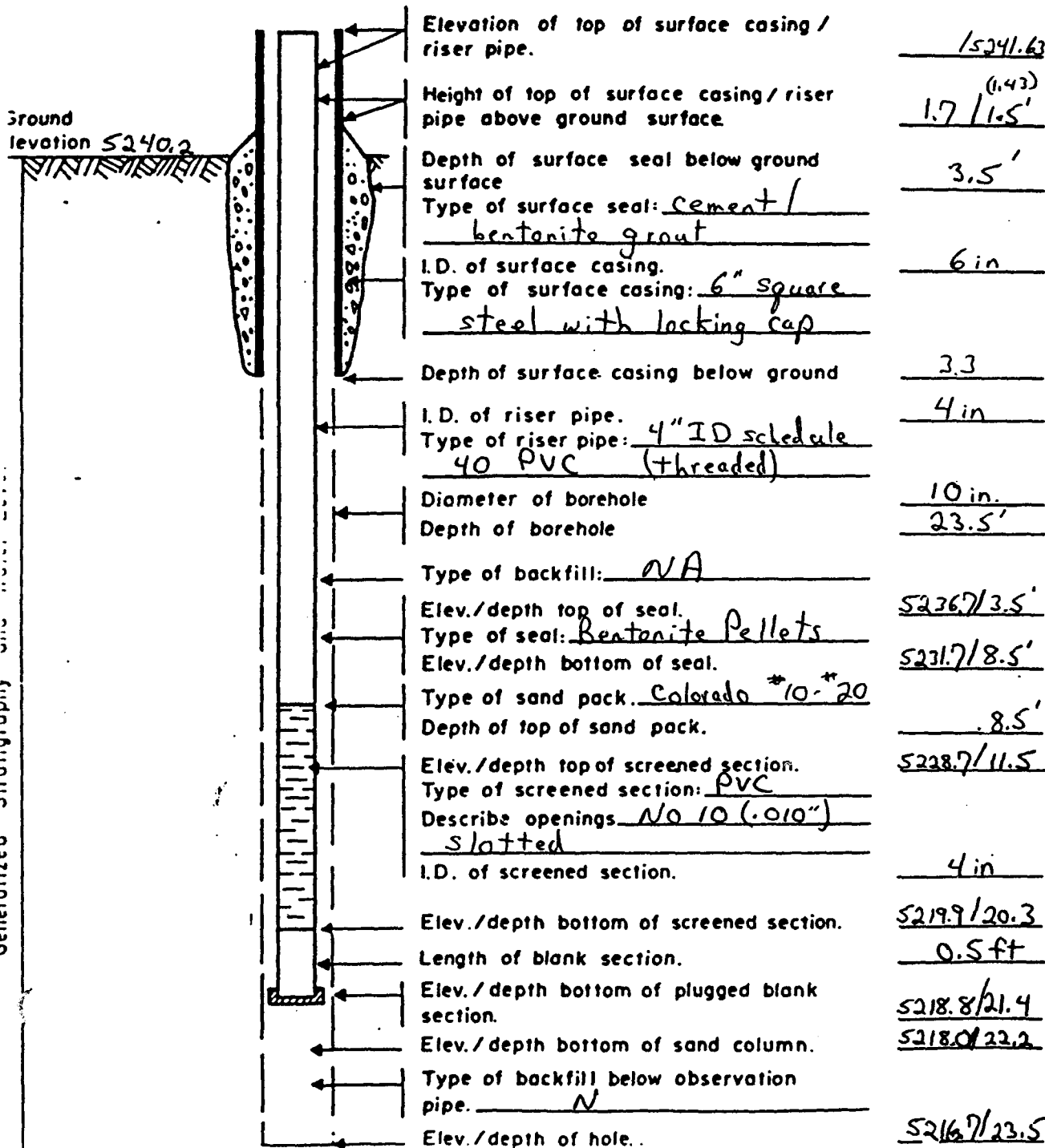
PROJECT <u>Rocky Mountain Arsenal Test #2</u>	Page <u>1</u> of <u>1</u>
LOCATION <u>Sec 36-17</u>	Well No. <u>36-187</u>
Work Completed <u>5/8/89</u> Original Depth _____	Aquifer <u>Alluvium</u>
Inspected By _____ Date _____	Depth Interval _____
Checked By _____ Date _____	

	Elevation of top of surface casing / riser pipe.	<u>5242.94</u>
	Height of top of surface casing / riser pipe above ground surface.	<u>1.7</u> <sup>(6.44)</sup> / <u>1.5</u>
	Depth of surface seal below ground surface	<u>3.5'</u>
	Type of surface seal: <u>Cement / bentonite grout</u>	
	I.D. of surface casing.	<u>6 in.</u>
	Type of surface casing: <u>6" square steel with locking cap</u>	
	Depth of surface casing below ground	<u>3.3</u>
	I.D. of riser pipe.	<u>4 in.</u>
	Type of riser pipe: <u>4" I.D. schedule 40 PVC (threaded)</u>	
	Diameter of borehole	<u>10 in.</u>
	Depth of borehole	<u>22.2'</u>
	Type of backfill: <u>NA</u>	
	Elev./depth top of seal.	<u>52380 / 3.5'</u>
	Type of seal: <u>Bentonite Pellets</u>	
	Elev./depth bottom of seal.	<u>52330 / 8.5'</u>
Type of sand pack: <u>Colorado #10-#20</u>		
Depth of top of sand pack.	<u>18.5'</u>	
Elev./depth top of screened section.	<u>5229.9 / 11.6'</u>	
Type of screened section: <u>PVC</u>		
Describe openings: <u>No 10 (.010") slot</u>		
I.D. of screened section.	<u>4 in.</u>	
Elev./depth bottom of screened section.	<u>52211 / 20.4'</u>	
Length of blank section.	<u>0.5 ft</u>	
Elev./depth bottom of plugged blank section.	<u>5220.0 / 21.5'</u>	
Elev./depth bottom of sand column.	<u>5219.3 / 22.2'</u>	
Type of backfill below observation pipe: <u>NA</u>		
Elev./depth of hole.	<u>5219.3 / 22.2</u>	

# GROUND WATER OBSERVATION WELL REPORT

RC-CT Rocky Mountain Arsenal Task #2  
 LOCATION Sec 36-17  
 Date Completed 5/4/89 Original Depth \_\_\_\_\_  
 Inspected By \_\_\_\_\_ Date \_\_\_\_\_  
 Checked By \_\_\_\_\_ Date \_\_\_\_\_

Page 1 of 1  
 Well No. 36-188  
 Aquifer Alluvium  
 Depth Interval \_\_\_\_\_





# GROUND WATER OBSERVATION WELL REPORT

PROJECT <u>Rocky Mountain Arsenal Task #2</u>	Page <u>1</u> of <u>1</u>
LOCATION <u>Sec 36-17</u>	Well No. <u>36-189</u>
Date Completed <u>5/2/89</u> Original Depth _____	Aquifer <u>Alluvium</u>
Inspected By _____ Date _____	Depth Interval _____
Checked By _____ Date _____	

	Elevation of top of surface casing / riser pipe.	<u>5241.02</u>
	Height of top of surface casing / riser pipe above ground surface	<u>(1.12) 1.7 / 1.5'</u>
	Depth of surface seal below ground surface	<u>3.5'</u>
	Type of surface seal: <u>Cement / bentonite grout</u>	
	I.D. of surface casing.	<u>6 in.</u>
	Type of surface casing: <u>6" Square steel with locking cap</u>	
	Depth of surface casing below ground	<u>3.3</u>
	I.D. of riser pipe.	<u>4 in</u>
	Type of riser pipe: <u>4" ID schedule 40 PVC (threaded)</u>	
	Diameter of borehole	<u>10 in</u>
	Depth of borehole	<u>22.5</u>
	Type of backfill: <u>NA</u>	
	Elev./depth top of seal.	<u>5236.4 / 3.5'</u>
	Type of seal: <u>Bentonite Pellets</u>	
	Elev./depth bottom of seal.	<u>5231.9 / 8.0'</u>
Type of sand pack: <u>Colorado #10-20</u>		
Depth of top of sand pack.	<u>8.0'</u>	
Elev./depth top of screened section.	<u>5228.3 / 11.6</u>	
Type of screened section: <u>PVC</u>		
Describe openings: <u>No 10 (.010") slotted</u>		
I.D. of screened section.	<u>4 in.</u>	
Elev./depth bottom of screened section.	<u>5219.5 / 20.4</u>	
Length of blank section.	<u>0.5 ft</u>	
Elev./depth bottom of plugged blank section.	<u>5218.4 / 21.5'</u>	
Elev./depth bottom of sand column.	<u>5217.4 / 22.5'</u>	
Type of backfill below observation pipe: <u>NA</u>		
Elev./depth of hole.	<u>5217.4 / 22.5</u>	

# GROUND WATER OBSERVATION WELL REPORT

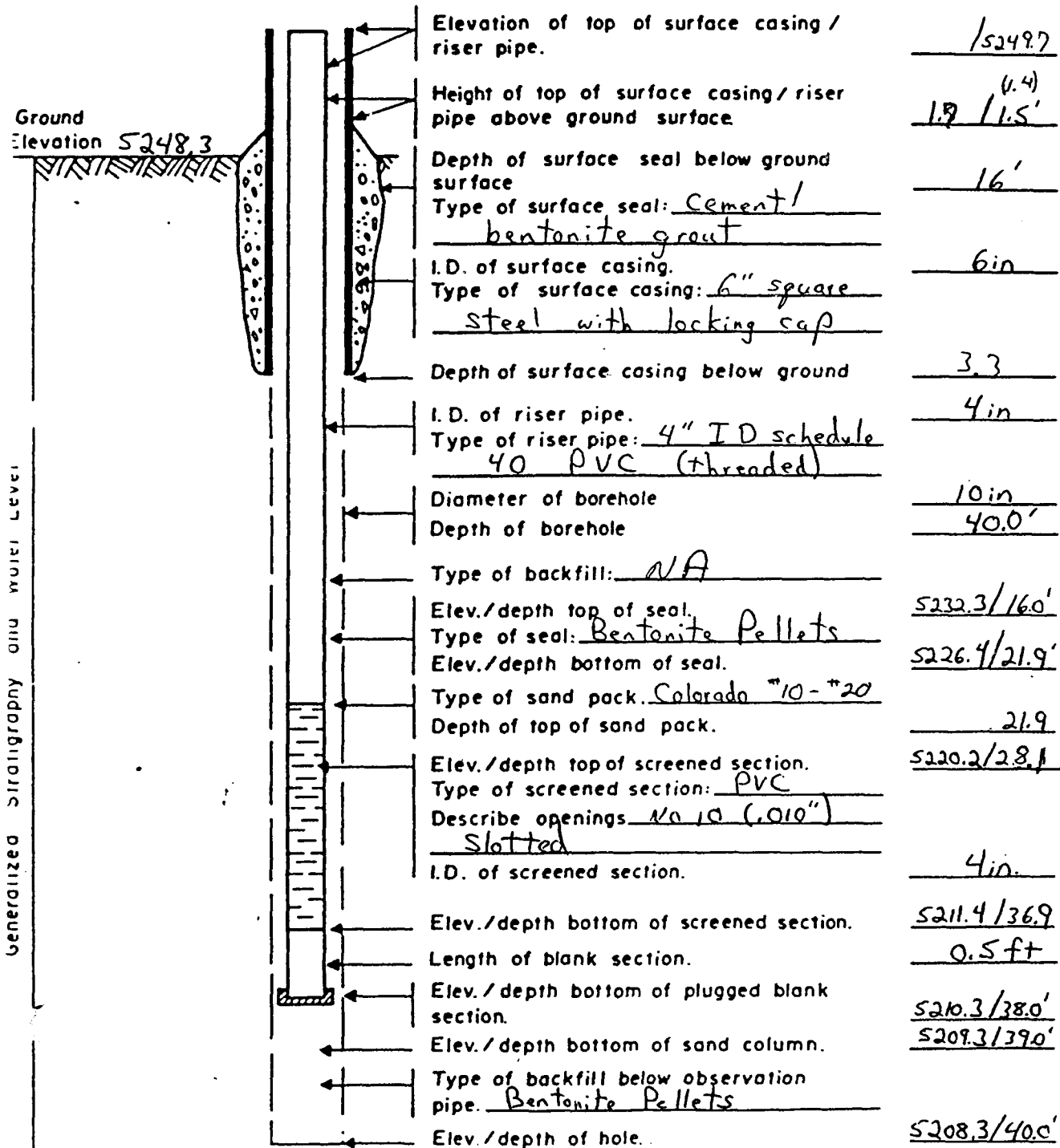
PROJECT <u>Rocky Mountain Arsenal Task #2</u>	Page <u>1</u> of <u>1</u>
LOCATION <u>Sec 36-17</u>	Well No. <u>36-190</u>
Date Completed <u>4/26/89</u> Original Depth _____	Aquifer <u>Alluvium</u>
Inspected By _____ Date _____	Depth Interval _____
Checked By _____ Date _____	

	<table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Elevation of top of surface casing / riser pipe.</td> <td style="width: 20%; text-align: right;"><u>5241.08</u></td> </tr> <tr> <td>Height of top of surface casing / riser pipe above ground surface</td> <td style="text-align: right;"><u>1.7 / 1.5'</u> <sup>(1.38)</sup></td> </tr> <tr> <td>Depth of surface seal below ground surface</td> <td style="text-align: right;"><u>3.0'</u></td> </tr> <tr> <td>Type of surface seal: <u>Cement / bentonite grout</u></td> <td></td> </tr> <tr> <td>I.D. of surface casing.</td> <td style="text-align: right;"><u>6 in.</u></td> </tr> <tr> <td>Type of surface casing: <u>6" square steel with locking cap</u></td> <td></td> </tr> <tr> <td>Depth of surface casing below ground</td> <td style="text-align: right;"><u>3.3</u></td> </tr> <tr> <td>I.D. of riser pipe.</td> <td style="text-align: right;"><u>4 in</u></td> </tr> <tr> <td>Type of riser pipe: <u>4" I.D. schedule 40 PVC (threaded)</u></td> <td></td> </tr> <tr> <td>Diameter of borehole</td> <td style="text-align: right;"><u>10 in</u></td> </tr> <tr> <td>Depth of borehole</td> <td style="text-align: right;"><u>20'</u></td> </tr> <tr> <td>Type of backfill: <u>NA</u></td> <td></td> </tr> <tr> <td>Elev./depth top of seal</td> <td style="text-align: right;"><u>5236.7 / 3.0'</u></td> </tr> <tr> <td>Type of seal: <u>Bentonite Pellets</u></td> <td></td> </tr> <tr> <td>Elev./depth bottom of seal.</td> <td style="text-align: right;"><u>5233.2 / 6.5'</u></td> </tr> <tr> <td>Type of sand pack: <u>Colorado #10-20</u></td> <td></td> </tr> <tr> <td>Depth of top of sand pack.</td> <td style="text-align: right;"><u>6.5'</u></td> </tr> <tr> <td>Elev./depth top of screened section.</td> <td style="text-align: right;"><u>5220.85 / 8.85'</u></td> </tr> <tr> <td>Type of screened section: <u>PVC</u></td> <td></td> </tr> <tr> <td>Describe openings: <u>No 10 (.010") slotted</u></td> <td></td> </tr> <tr> <td>I.D. of screened section.</td> <td style="text-align: right;"><u>4 in</u></td> </tr> <tr> <td>Elev./depth bottom of screened section.</td> <td style="text-align: right;"><u>5222.05 / 12.65</u></td> </tr> <tr> <td>Length of blank section.</td> <td style="text-align: right;"><u>0.5 ft</u></td> </tr> <tr> <td>Elev./depth bottom of plugged blank section.</td> <td style="text-align: right;"><u>5220.95 / 13.25'</u></td> </tr> <tr> <td>Elev./depth bottom of sand column.</td> <td style="text-align: right;"><u>5219.7 / 20.0'</u></td> </tr> <tr> <td>Type of backfill below observation pipe.</td> <td></td> </tr> <tr> <td>Elev./depth of hole.</td> <td style="text-align: right;"><u>5219.7 / 20.0'</u></td> </tr> </table>	Elevation of top of surface casing / riser pipe.	<u>5241.08</u>	Height of top of surface casing / riser pipe above ground surface	<u>1.7 / 1.5'</u> <sup>(1.38)</sup>	Depth of surface seal below ground surface	<u>3.0'</u>	Type of surface seal: <u>Cement / bentonite grout</u>		I.D. of surface casing.	<u>6 in.</u>	Type of surface casing: <u>6" square steel with locking cap</u>		Depth of surface casing below ground	<u>3.3</u>	I.D. of riser pipe.	<u>4 in</u>	Type of riser pipe: <u>4" I.D. schedule 40 PVC (threaded)</u>		Diameter of borehole	<u>10 in</u>	Depth of borehole	<u>20'</u>	Type of backfill: <u>NA</u>		Elev./depth top of seal	<u>5236.7 / 3.0'</u>	Type of seal: <u>Bentonite Pellets</u>		Elev./depth bottom of seal.	<u>5233.2 / 6.5'</u>	Type of sand pack: <u>Colorado #10-20</u>		Depth of top of sand pack.	<u>6.5'</u>	Elev./depth top of screened section.	<u>5220.85 / 8.85'</u>	Type of screened section: <u>PVC</u>		Describe openings: <u>No 10 (.010") slotted</u>		I.D. of screened section.	<u>4 in</u>	Elev./depth bottom of screened section.	<u>5222.05 / 12.65</u>	Length of blank section.	<u>0.5 ft</u>	Elev./depth bottom of plugged blank section.	<u>5220.95 / 13.25'</u>	Elev./depth bottom of sand column.	<u>5219.7 / 20.0'</u>	Type of backfill below observation pipe.		Elev./depth of hole.	<u>5219.7 / 20.0'</u>
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Elev./depth of hole.	<u>5219.7 / 20.0'</u>																																																						

# GROUND WATER OBSERVATION WELL REPORT

PROJECT Rocky Mountain Arsenal Task #2  
 LOCATION Sec 36-17  
 Date Completed 5/11/89 Original Depth \_\_\_\_\_  
 Inspected By \_\_\_\_\_ Date \_\_\_\_\_  
 Checked By \_\_\_\_\_ Date \_\_\_\_\_

Page 1 of 1  
 Well No. 36-191  
 Aquifer Denver  
 Formation \_\_\_\_\_  
 Depth Interval \_\_\_\_\_



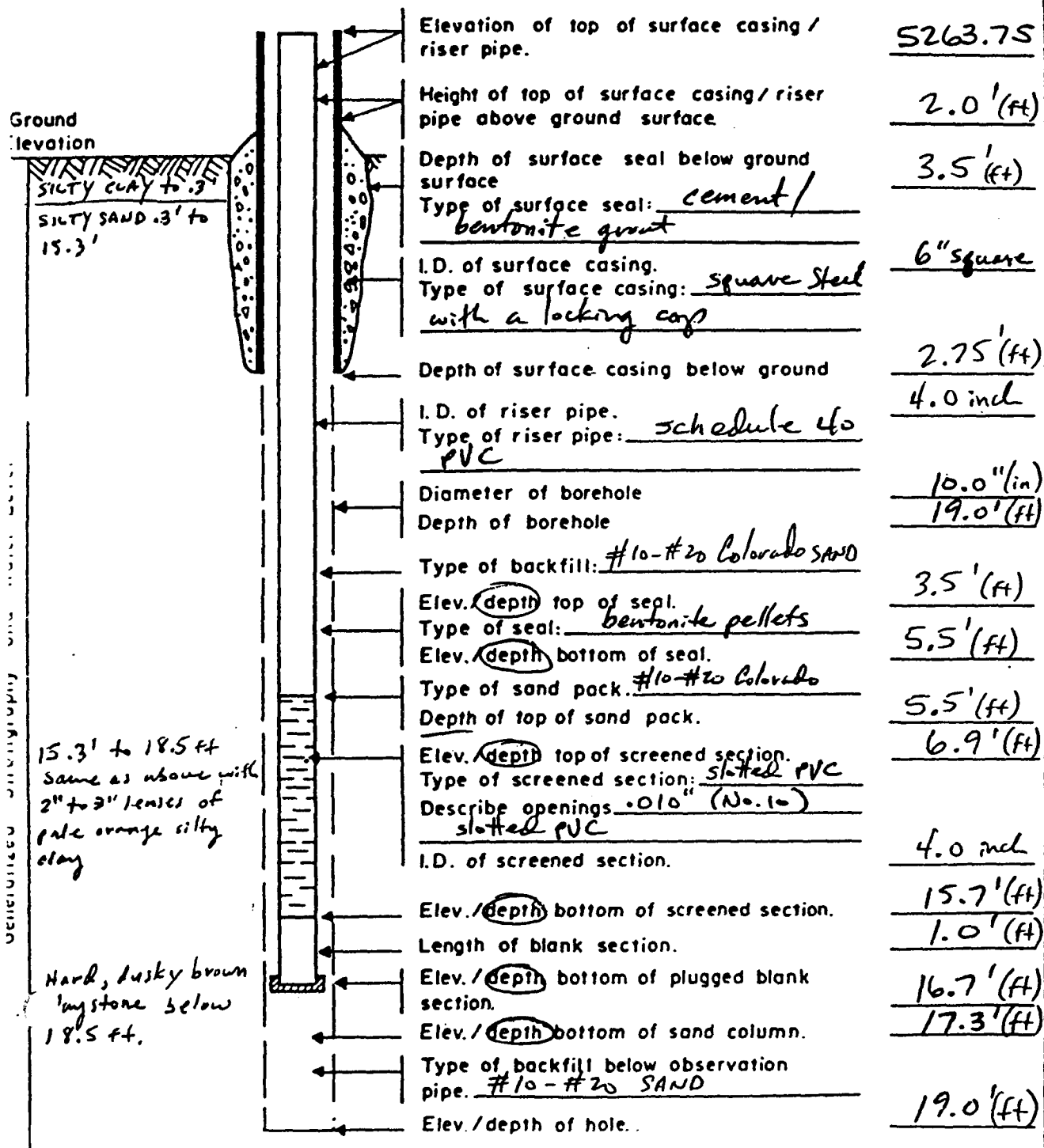
# GROUND WATER OBSERVATION WELL REPORT

PROJECT <u>Rocky Mountain Arsenal Task #2</u>		Page <u>1</u> of <u>1</u>
LOCATION <u>Sec 36-17</u>		Well No. <u>36-192</u>
Date Completed <u>5/19/89</u> Original Depth _____		Aquifer <u>Denver</u>
Inspected By _____	Date _____	Formation _____
Checked By _____	Date _____	Depth Interval _____

	Elevation of top of surface casing / riser pipe.	<u>5255.14</u>
	Height of top of surface casing / riser pipe above ground surface.	<u>1.7</u> <sup>(4.46)</sup> / <u>1.5'</u>
	Depth of surface seal below ground surface.	<u>40.0'</u>
	Type of surface seal: <u>Cement / bentonite grout</u>	
	I.D. of surface casing.	<u>6in</u>
	Type of surface casing: <u>6" square steel with locking cap</u>	
	Depth of surface casing below ground	<u>3.3</u>
	I.D. of riser pipe.	<u>4in.</u>
	Type of riser pipe: <u>4" I.D. schedule 40 PVC (threaded)</u>	
	Diameter of borehole	<u>10in</u>
	Depth of borehole	<u>65.0'</u>
	Type of backfill: <u>NA</u>	
	Elev./depth top of seal.	<u>5213.68 / 40.0'</u>
	Type of seal: <u>Bentonite Pellets</u>	
	Elev./depth bottom of seal.	<u>5208.64 / 45.0</u>
Type of sand pack: <u>Colorado #10-#20</u>		
Depth of top of sand pack.	<u>45.0</u>	
Elev./depth top of screened section.	<u>5198.58 / 55.1</u>	
Type of screened section: <u>PVC</u>		
Describe openings: <u>No 10 (.010") slotted</u>		
I.D. of screened section.	<u>4in.</u>	
Elev./depth bottom of screened section.	<u>5187.58 / 63.9</u>	
Length of blank section.	<u>0.5 ft</u>	
Elev./depth bottom of plugged blank section.	<u>5188.68 / 65.0'</u>	
Elev./depth bottom of sand column.	<u>5188.68 / 65.0'</u>	
Type of backfill below observation pipe: <u>NA</u>		
Elev./depth of hole.	<u>5188.68 / 65.0'</u>	

# GROUND WATER OBSERVATION WELL REPORT

PROJECT <u>222380 RMA task 2</u>	Page <u>1</u> of <u>1</u>
LOCATION <u>SECTION 3L</u>	Well No. <u>36193</u>
Date Completed <u>5-17-89</u> Original Depth <u>19.0 ft</u>	Aquifer <u>Alluvial</u>
Inspected By _____ Date _____	Depth Interval _____
Checked By _____ Date _____	



# GROUND WATER OBSERVATION WELL REPORT

OBJECT <u>RMA task 2</u>	Page <u>1</u> of <u>1</u>
CATION <u>Section 36</u>	Well No. <u>36194</u>
re completed <u>6/16/89</u> Original Depth <u>28.0 (ft)</u>	Aquifer <u>alluvial</u>
ected By _____ Date _____	Depth Interval _____
ected By _____ Date _____	

<p>ground variation</p>	Elevation of top of surface casing / riser pipe.	<u>5256.16</u>
	Height of top of surface casing / riser pipe above ground surface.	<u>2.0 (ft)</u>
<p>SILTY SAND, loose, fine-grained, well-sorted, subangular, dark yellowish-brown on surface to mat. yellowish-brown below 1.1 feet. Slightly wet.</p>	Depth of surface seal below ground surface.	<u>4.0 (ft)</u>
	Type of surface seal: <u>cement / bentonite seal</u>	<u>6" square</u>
<p>material becomes wet at a depth of 12.5 ft.</p>	I.D. of surface casing.	<u>6" square</u>
	Type of surface casing: <u>steel with locking caps</u>	<u>2.75 (ft)</u>
<p>free water enters tube at a depth of 16.8 ft.</p>	Depth of surface casing below ground	<u>4.0 inch</u>
	I.D. of riser pipe.	<u>schedule 40</u>
<p>color changes to a moderate brown at a depth of 19.0 ft)</p>	Type of riser pipe: <u>PVC with threaded connections</u>	<u>10.0 inch</u>
	Diameter of borehole	<u>28.0 (ft)</u>
<p>with some thin seams of very pale orange silty clay from 20.8' to 21.6'</p>	Depth of borehole	<u>4.0 (ft)</u>
	Type of backfill: <u>#10-#20 Colorado sand</u>	<u>9.0 (ft)</u>
<p>sandy silty clay, pale yellowish-brown w/ gravel sized inclusions of dusky yellowish-brown sand shale or clay (21.6'-26.5')</p>	Elev. (depth) top of seal.	<u>9.0 (ft)</u>
	Type of seal: <u>bentonite pellets</u>	<u>9.0 (ft)</u>
<p>26.5' to 28.0' - SILTY CLAY, black, dusky brown WEATHERED BEDROCK</p>	Elev. (depth) bottom of seal.	<u>9.0 (ft)</u>
	Type of sand pack: <u>#10-#20 Colorado</u>	<u>14.2 (ft)</u>
	Depth of top of sand pack.	<u>4.0 inch</u>
	Elev. (depth) top of screened section.	<u>23.0 (ft)</u>
	Type of screened section: <u>slotted PVC</u>	<u>1.0 (ft)</u>
	Describe openings: <u>#10 slotted</u>	<u>24.0 (ft)</u>
	I.D. of screened section.	<u>28.0 (ft)</u>
	Elev. (depth) bottom of screened section.	<u>28.0 (ft)</u>
	Length of blank section.	<u>28.0 (ft)</u>
	Elev. (depth) bottom of plugged blank section.	<u>28.0 (ft)</u>
	Elev. (depth) bottom of sand column.	<u>28.0 (ft)</u>
	Type of backfill below observation pipe: <u>#10-#20 Colorado SAND</u>	<u>28.0 (ft)</u>
	Elev. (depth) of hole.	<u>28.0 (ft)</u>

**APPENDIX G**  
**EXPLORATORY TRENCH CROSS-SECTIONS**

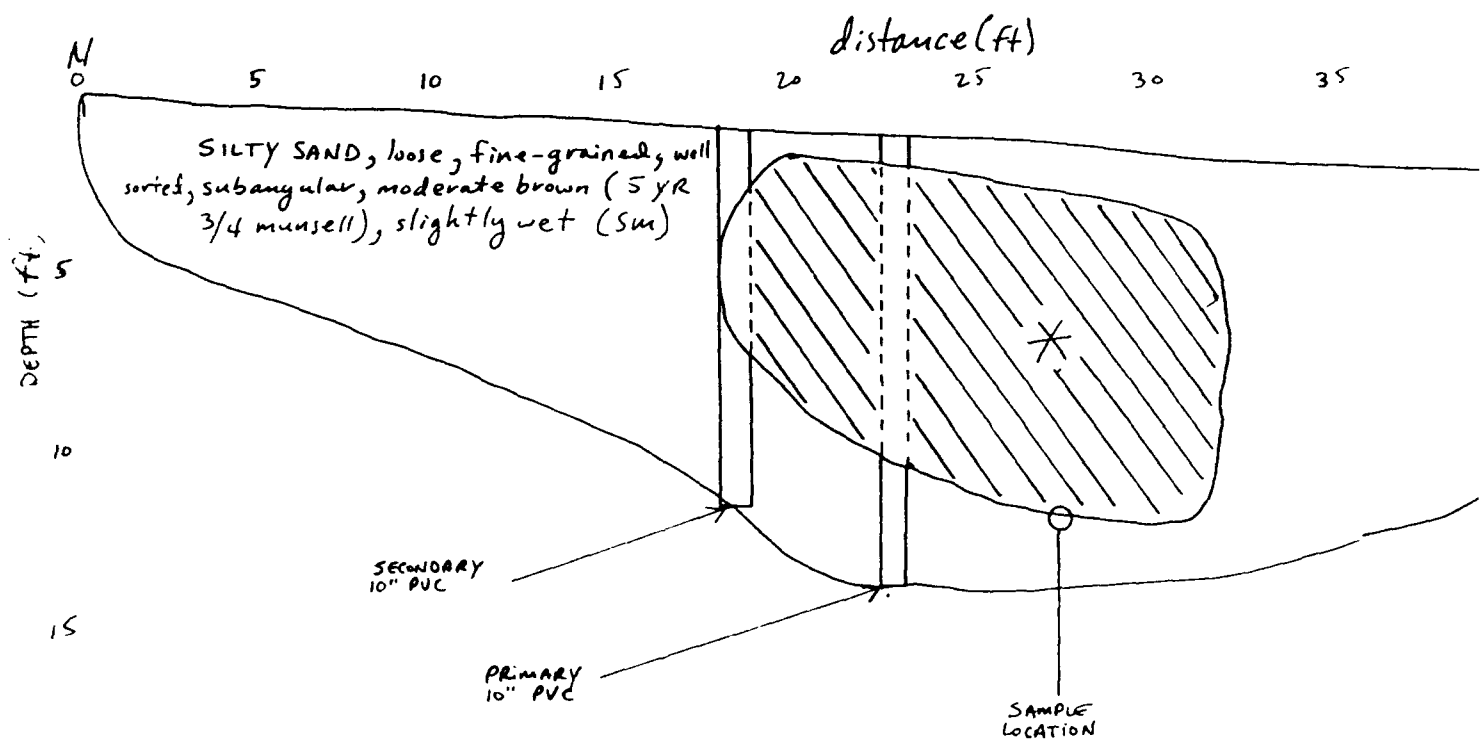
---

LOGGER: STEVEN E. MORRISSETTE  
DATE: 4-24-89  
BACKHOE OPERATOR: CHARLIE WHARTON  
TIME: 15:30

INSTRUMENT READINGS:

- a) H<sub>A</sub> - Background
- b) MIB - All negative

PROJECT NAME/#: RMA task 2  
TRENCH ID: TRENCH #1, section 36  
COMPASS ORIENTATION: 348°NW  
SCALE: 1"=5'



\*DEBRIS: Various scrap metal (wire, steel strips incendiary casings), silty sand mat

(1)

(2)

Job No. :
Prepared I
Date :



PROJECT NAME/#: RMA task 2

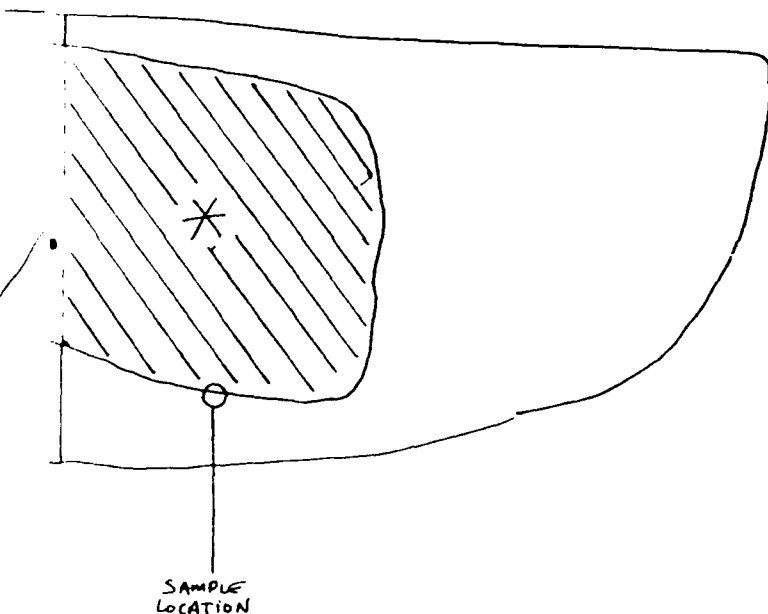
TRENCH ID: TRENCH #1, section 36-17N, anomaly area A

COMPASS ORIENTATION: 348°NW

SCALE: 1"=5'

width (ft)

25 30 35 40 45

5  
10  
15  
DEPTH (ft)

is: Various scrap metal (wire, steel strips, burned out incendiary casings), silty sand matrix.

(3)

(2)

Job No. : 22238

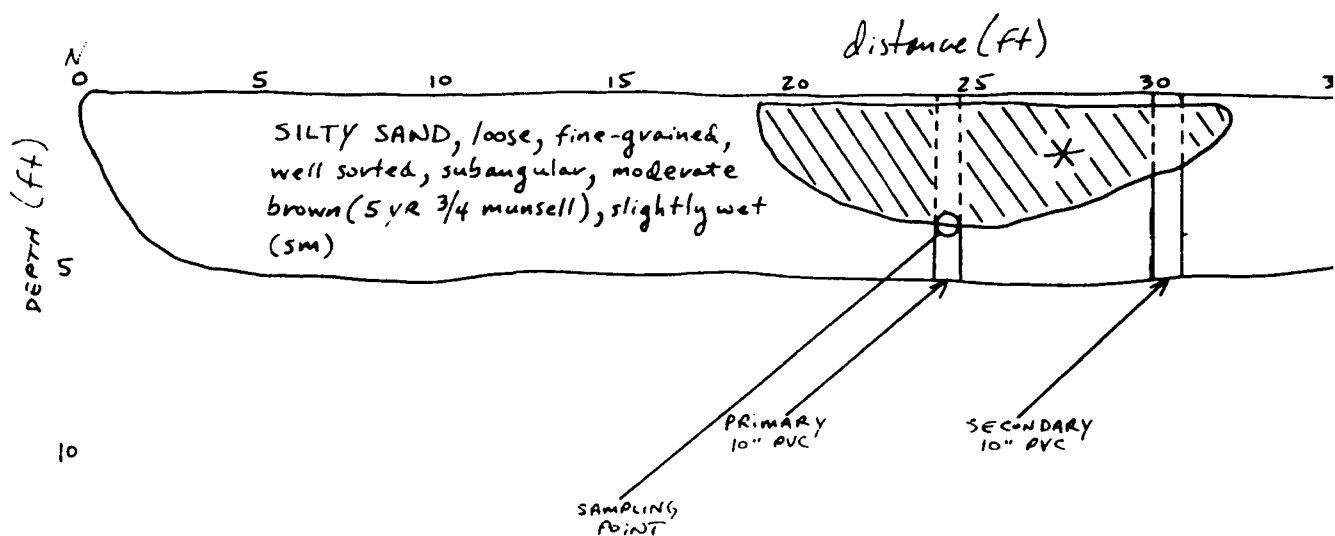
Prepared by: S.E.M.

Date: 8/14/89

Figure G-1 CROSS-SECTION  
OF TRENCH NO. 1SITE 36-17N  
ANOMALOUS AREA A

LOGGER: STEVEN E MORRISSETTE  
DATE: 4-25-89  
BACKHOE OPERATOR: JIGGS ENNIS  
TIME: 08:46  
INSTRUMENT READINGS:  
a) 4Nn - Background  
b) MIB - All negative

PROJECT NAME/#: RMA +  
TRENCH I.D.: TRENCH #2,  
ORIENTATION: 353° NW  
SCALE: 1" = 5'



\* DEBRIS: Various pieces of  
burned-out inc

(1)

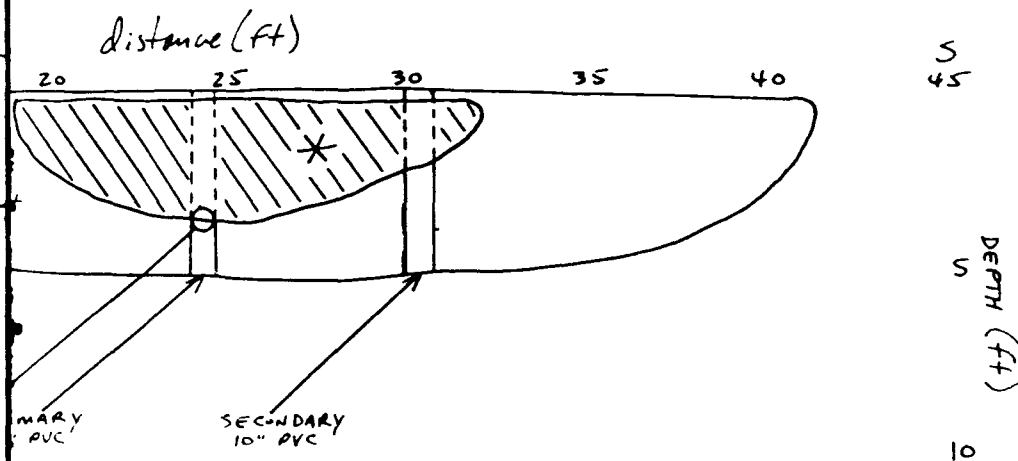
(2)

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH #2, section 36-17N, anomaly area A

ORIENTATION: 353° NW

SCALE: 1" = 5'



\* DEBRIS: Various pieces of scrap metal, wire,  
burned-out incendiary casings, ~~etc.~~

Job No. : 22238

Prepared by: S.E.M.

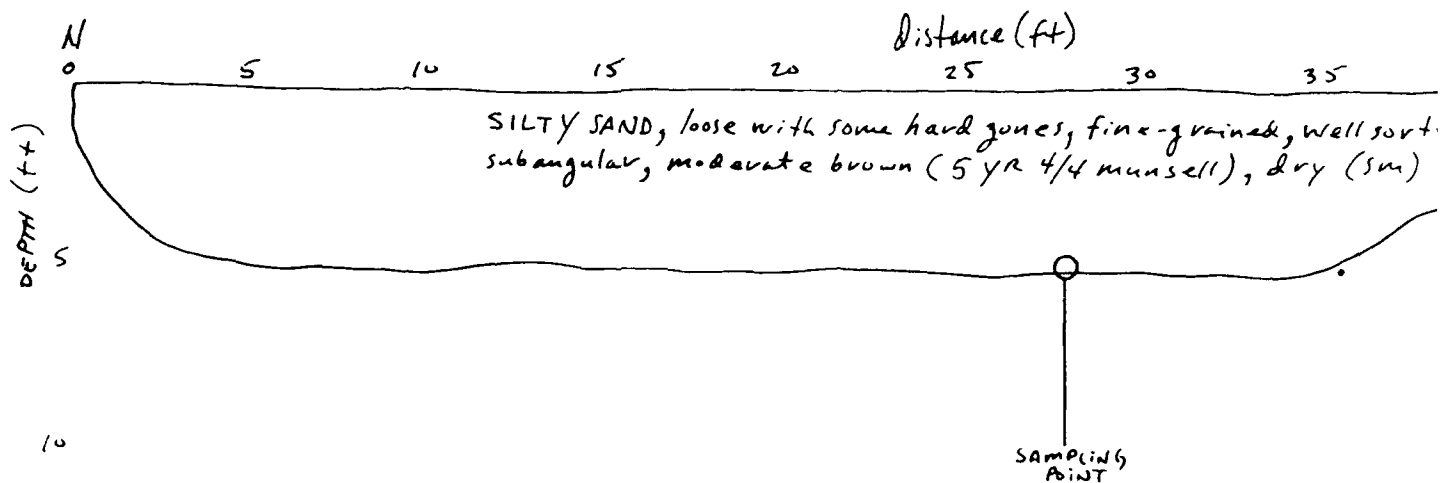
Date: 8/14/89

Figure G-2 CROSS-SECTION  
OF TRENCH NO. 2

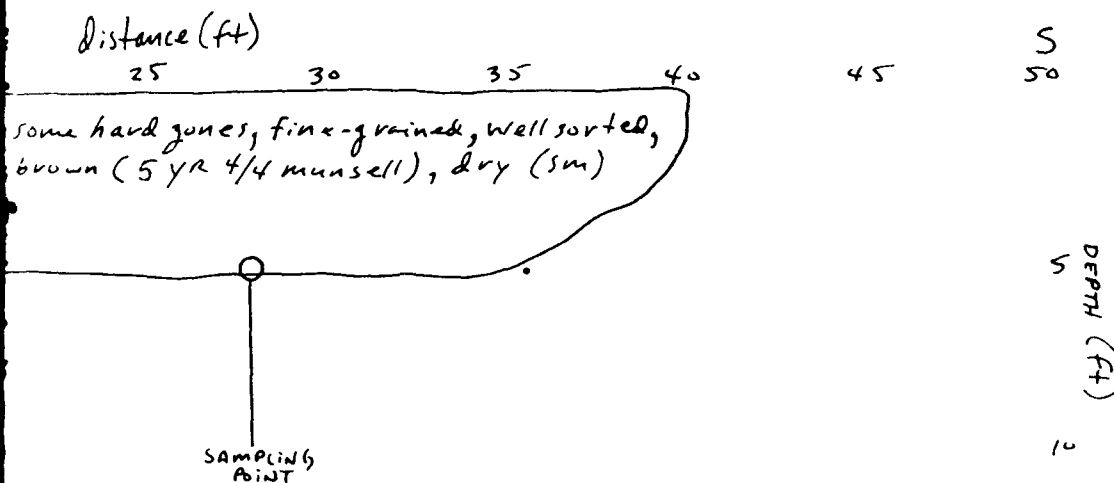
SITE 36-17N  
ANOMALOUS AREA A

LOGGER: STEVEN E. MORRISSETTE  
DATE: 4-25-89  
BACKHOE OPERATOR: JAMES "JIGGS" ENNIS  
TIME: 11:43  
INSTRUMENT READINGS:  
a) HNU - Background  
b) MIB - All negative

PROJECT NAME/#: RMA task 2  
TRENCH ID: TRENCH #3, section  
COMPASS ORIENTATION: 031° NE  
SCALE: 1" = 5'



PROJECT NAME/#: RMA task 2  
TRENCH ID: TRENCH #3, section 36-17N, anomaly area F  
COMPASS ORIENTATION: 031° NE  
SCALE: 1" = 5'



Job No. : 22238

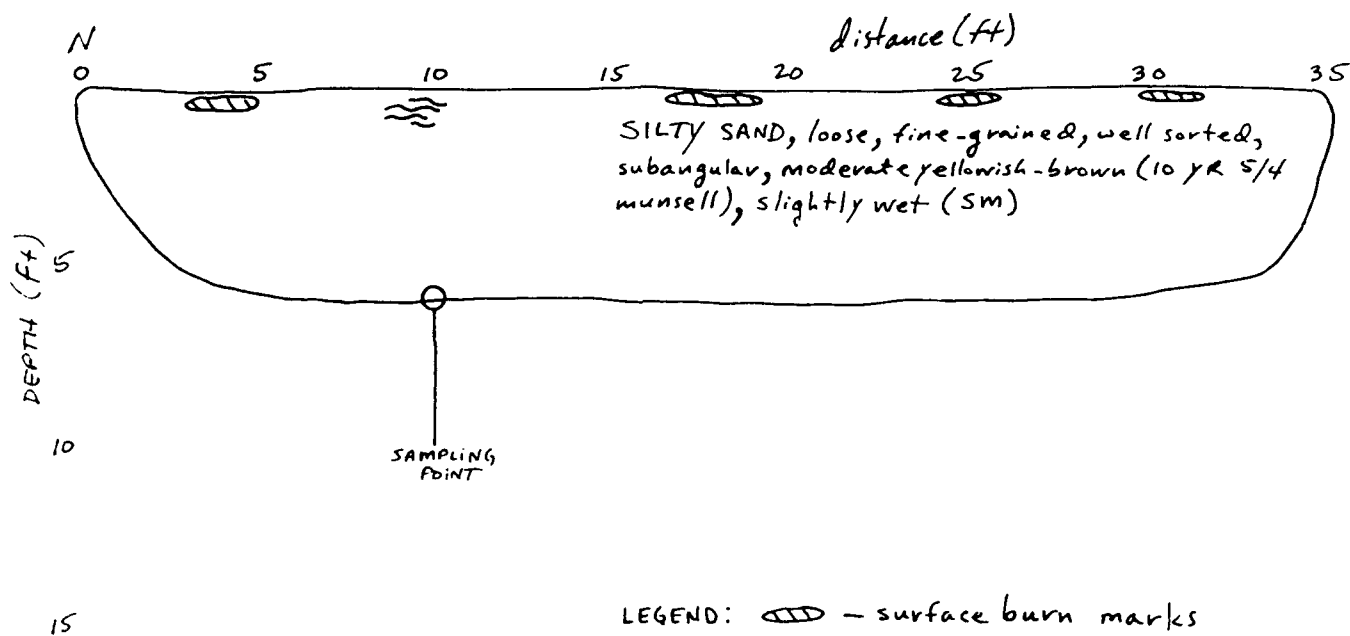
Prepared by: S.E.M.


Date: 8/14/89


Figure G-3 CROSS-SECTION  
OF TRENCH NO. 3  
SITE 36-17N  
ANOMALOUS AREA F

LOGGER: STEVEN E. MORRISSETTE  
DATE: 4-26-89  
BACKHOE OPERATOR: CHARLIE WHARTON  
TIME: 09:30  
INSTRUMENT READINGS:  
a) HNU - Background  
b) M18 - M1 negative

PROJECT NAME/#: RMA task 2  
TRENCH I.D.: TRENCH #4, sect:  
COMPASS ORIENTATION: 350° NW  
SCALE: 1" = 5'



LEGEND:  - surface burn marks

 - buried metal bars (approx. 3/8" diameter)

②

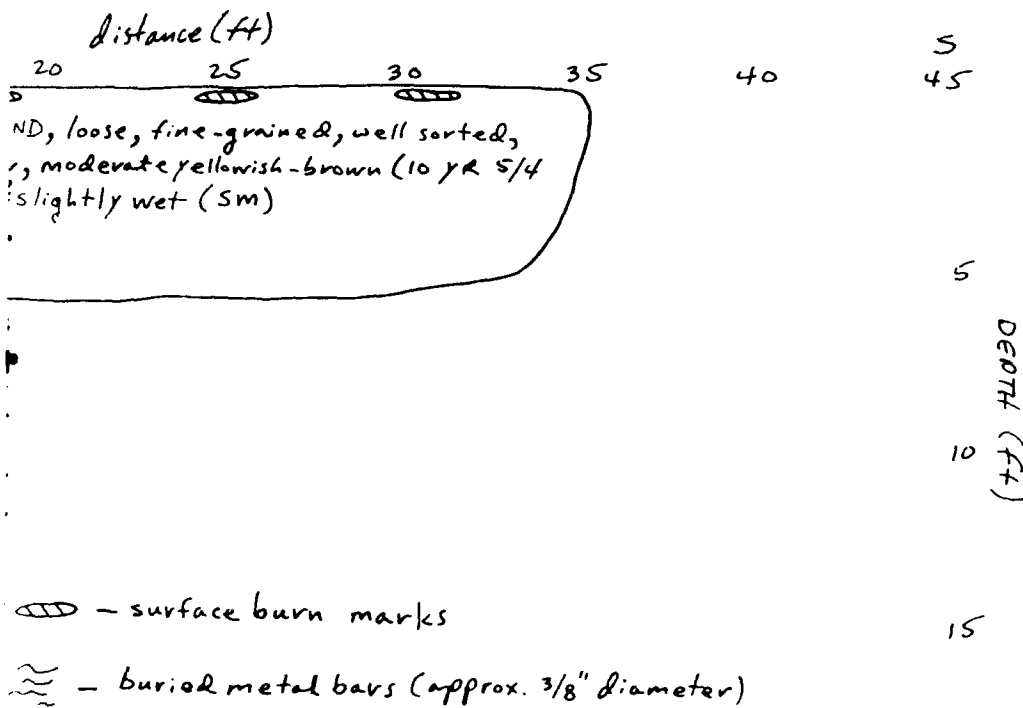
Job No. :
Prepared
Date :

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH #4, section 36-17N, anomaly area H

COMPASS ORIENTATION: 350° NW

SCALE: 1" = 5'



Job No.: 22238

Prepared by: S.E.M.

Date: 8/14/89

Figure G-4 CROSS-SECTION  
OF TRENCH NO. 4

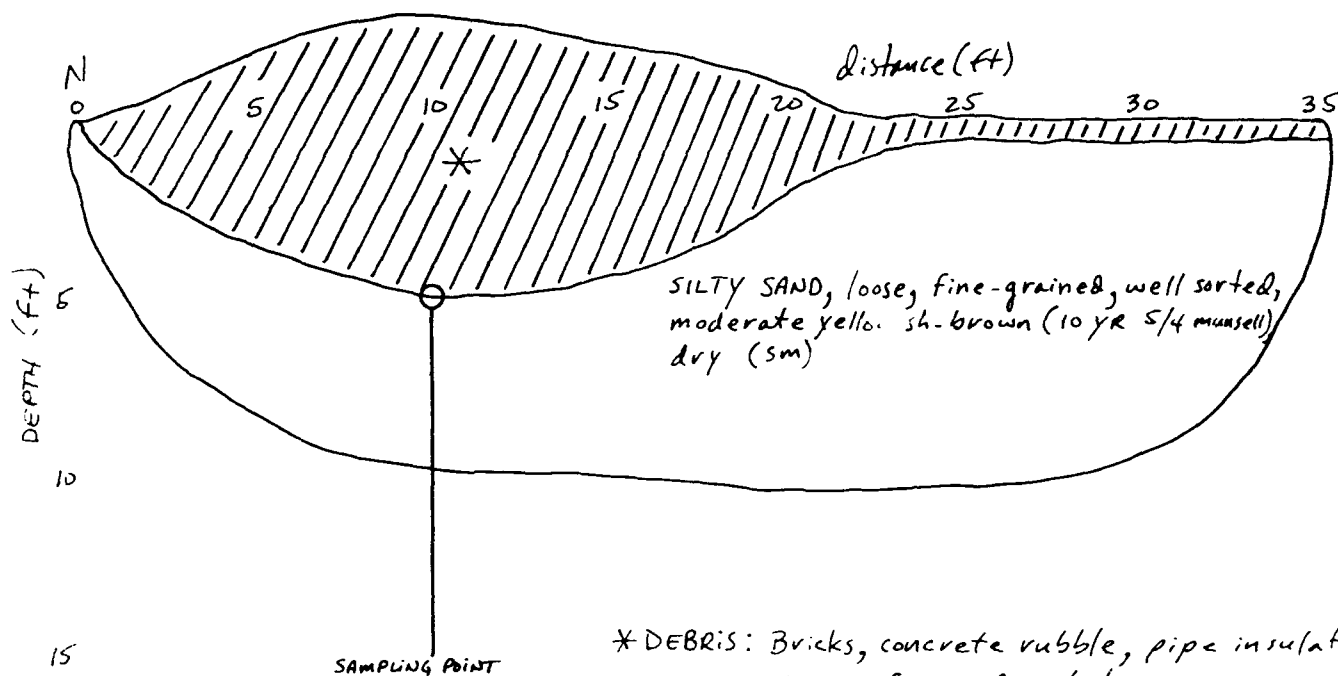
SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE  
DATE: 5-3-89  
BACKHOE OPERATOR: JAMES "JIGGS" ENNIS  
TIME: 13:30

INSTRUMENT READINGS:

- a) HNU - Background
- b) MIB - All negative

PROJECT NAME/#: RMA task 2  
TRENCH I.D.: TRENCH #5, section 36  
COMPASS ORIENTATION: 332°  
SCALE: 1" = 5'



11

Job No. :

Prepared by:

Date:



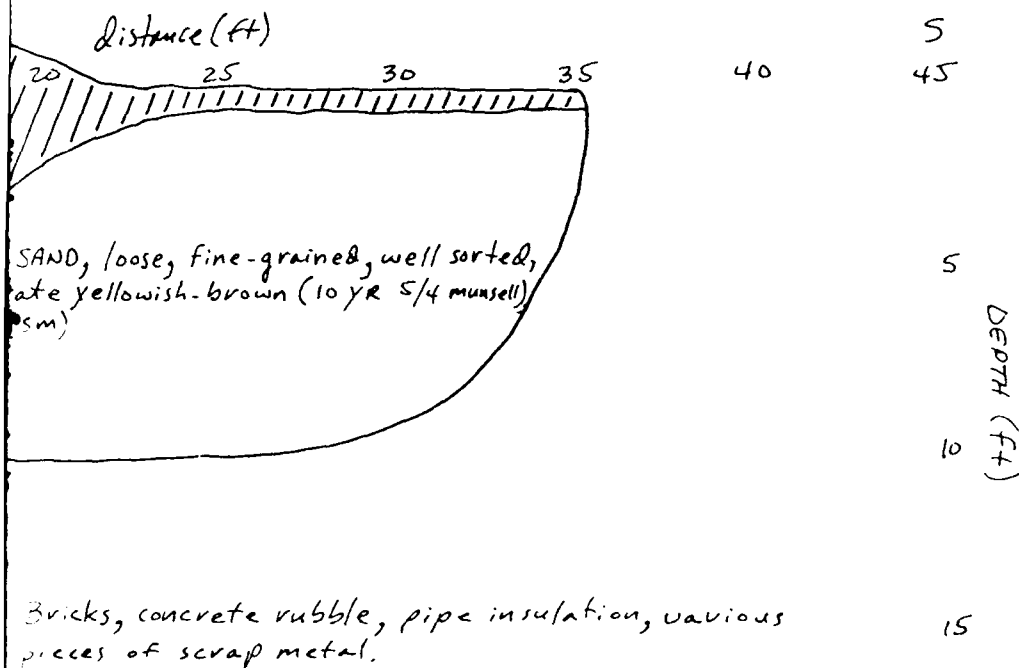
PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH #5, section 36-17N, anomaly area H

COMPASS ORIENTATION: 332°

SCALE: 1"=5'

" ENNIS



Job No. : 22238

Prepared by: S.E.M.

Date: 8/14/89

Figure G-5 CROSS-SECTION  
OF TRENCH NO. 5SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE

DATE: 5-4-89

BACKHOE OPERATOR: Bud Thrift

TIME: 11:20

INSTRUMENT READINGS:

a) HNU - Background

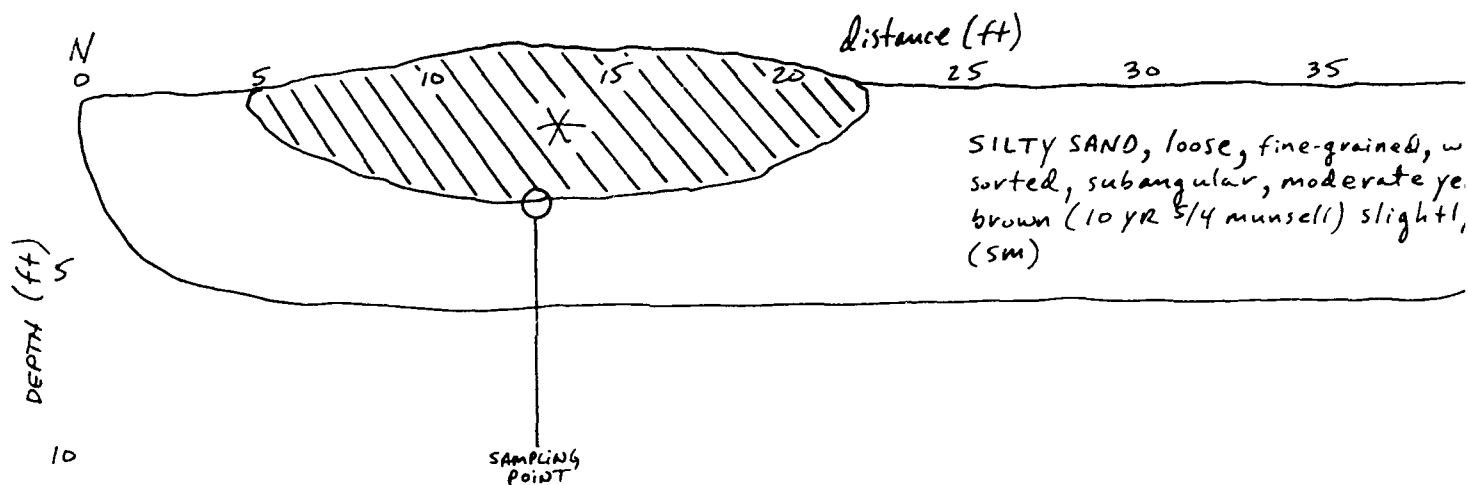
b) MIB - All negative

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH #6, section

COMPASS ORIENTATION: 343° NW

SCALE: 1" = 5'



\* DEBRIS: Bricks, concrete rubble, asphalt, plastic caps, barrel lids, various rebar.

Job No.

Prepare

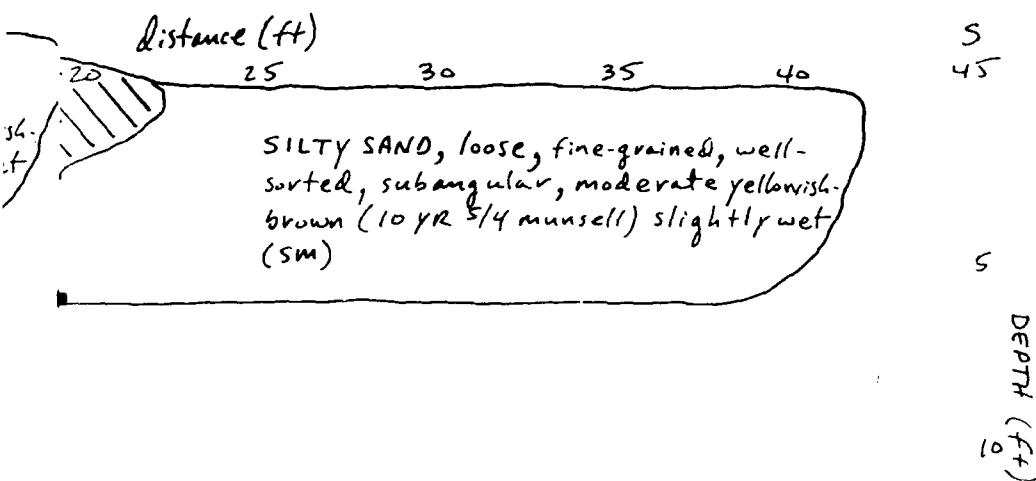
Date:

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH #6, section 36-17N, anomaly area H

COMPASS ORIENTATION: 343° NW

SCALE: 1" = 5'



\*DEBRIS: Bricks, concrete rubble, asphalt rubble, plastic caps, barrel lids, various wire, rebar.

Job No.: 22238

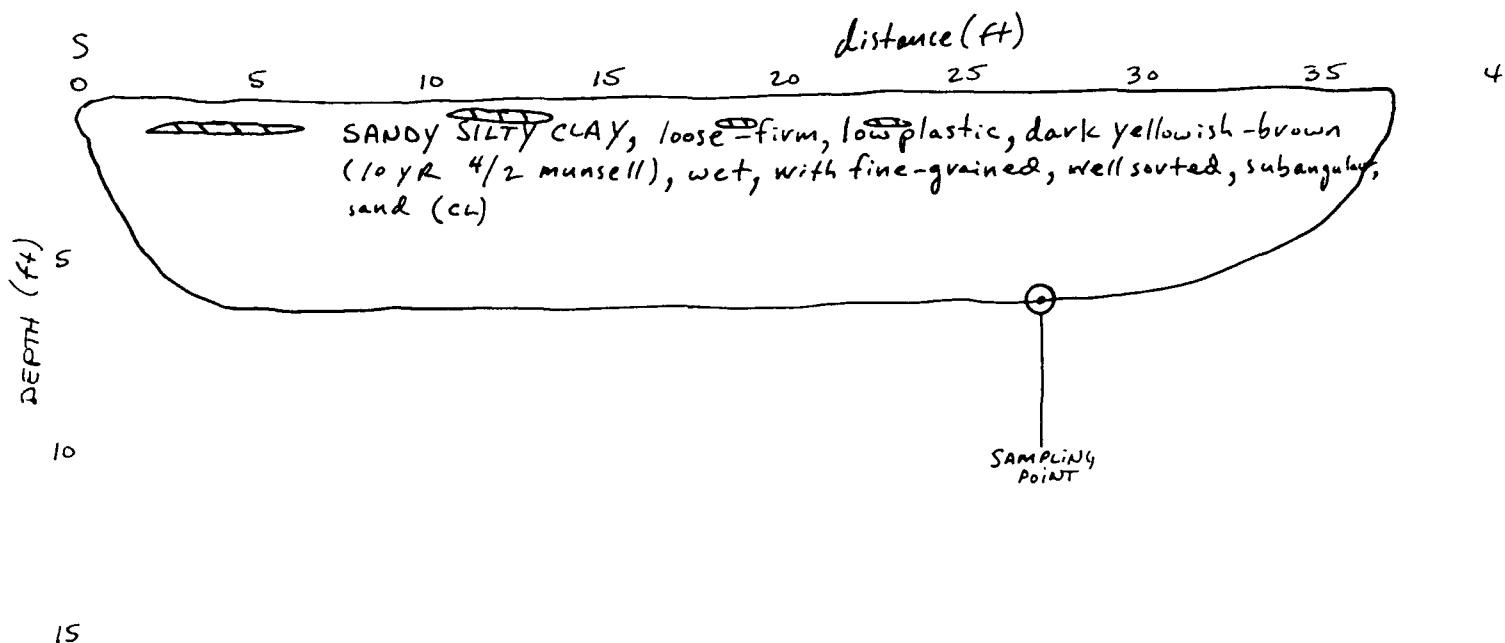
Prepared by: S.E.M.

Date: 8/14/89

Figure G-6 CROSS-SECTION  
OF TRENCH NO. 6  
SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE  
DATE: 4-26-89  
BACKHOE OPERATOR: CHARLIE WHARTON  
TIME: 11:55  
INSTRUMENT READINGS:  
a) HNU - Background  
b) MIB - All negative

PROJECT NAME/#: RMA task 2  
TRENCH I.D.: TRENCH #7, section 36  
COMPASS ORIENTATION: ~~308~~ 001  
SCALE: 1" = 5'



LEGEND: - Rust staining at a depth of 0.5 - 1.0 feet

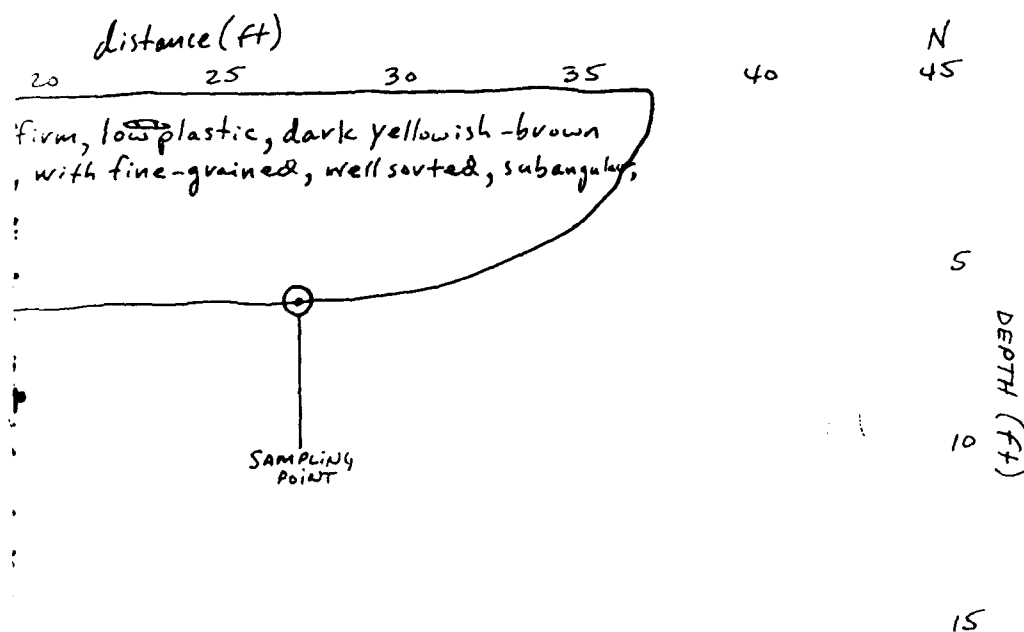
Job No. :  
Prepared by :  
Date :

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH #7, section 36-17N, anomaly area H

COMPASS ORIENTATION: ~~308~~ <sup>N</sup> 006°

SCALE: 1" = 5'



Rust staining at a depth of 0.5-1.0 foot.

(3)

Job No.: 22238

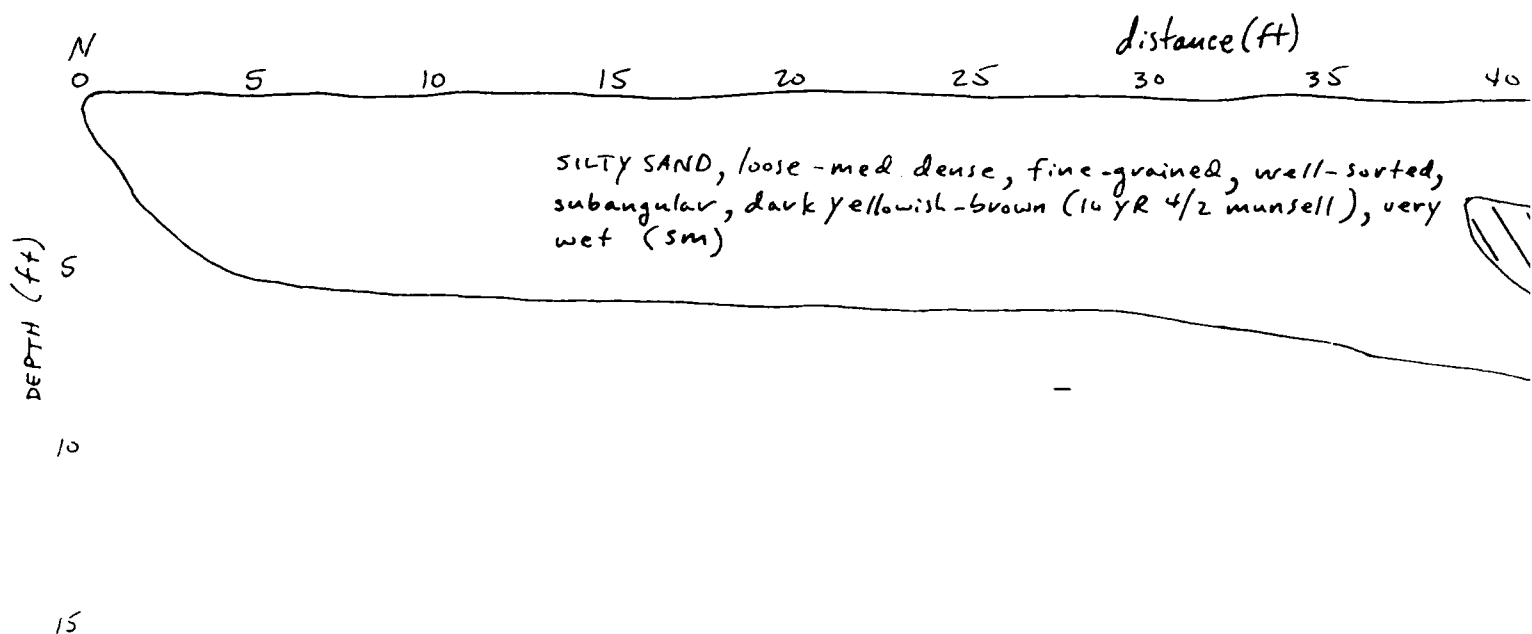
Prepared by: S.E.M.

Date: 8/14/89

Figure G-7 CROSS-SECTION  
OF TRENCH NO. 7  
SITE 36-17N  
ANOMALOUS AREA H

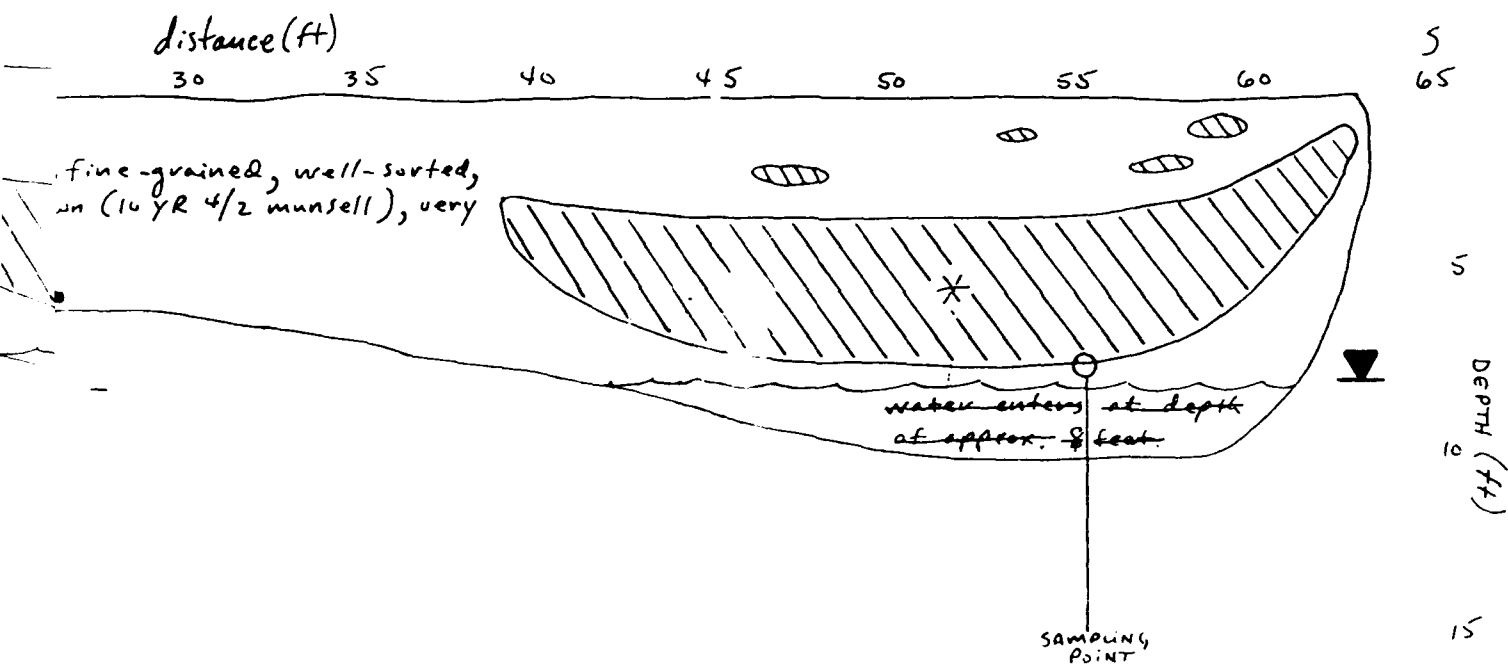
LOGGER: STEVEN E. MORRISSETTE  
DATE: 5-3-89  
BACKHOE OPERATOR: CHARLIE WHARTON  
TIME: 10:15  
INSTRUMENT READINGS:  
a) HNa - Background  
b) MIB - All negative

PROJECT NAME/#: RMA task 2  
TRENCH I.D.: TRENCH 7B, section 36-17  
COMPASS ORIENTATION: 340°  
SCALE: 1" = 5'



\* DEBRIS: Burned wood, charcoal, various pieces of scrap metal (pipes, sludge, rubber hoses, rust staining, ~~silty sand matrix~~).

PROJECT NAME/#: RMA task 2  
 NCH I.D.: TRENCH 7B, section 36-17N, anomaly area H  
 PASS ORIENTATION: 340°  
 LE: 1" = 5'



various pieces of scrap metal (pipes, wire, cable), black & gray staining, silty sand matrix.

Job No. :	22238
Prepared by :	S. E. M.
Date :	8/14/89

Figure G-8 CROSS-SECTION  
 OF TRENCH NO. 7B  
 SITE 36-17N  
 WEST OF ANOMALOUS AREA H

LOGGER: STEVEN E. MURRISSETTE

DATE: 5-3-89

BACKHOE OPERATOR: CHARLIE WHARTON

TIME: 11:30

INSTRUMENT READINGS:

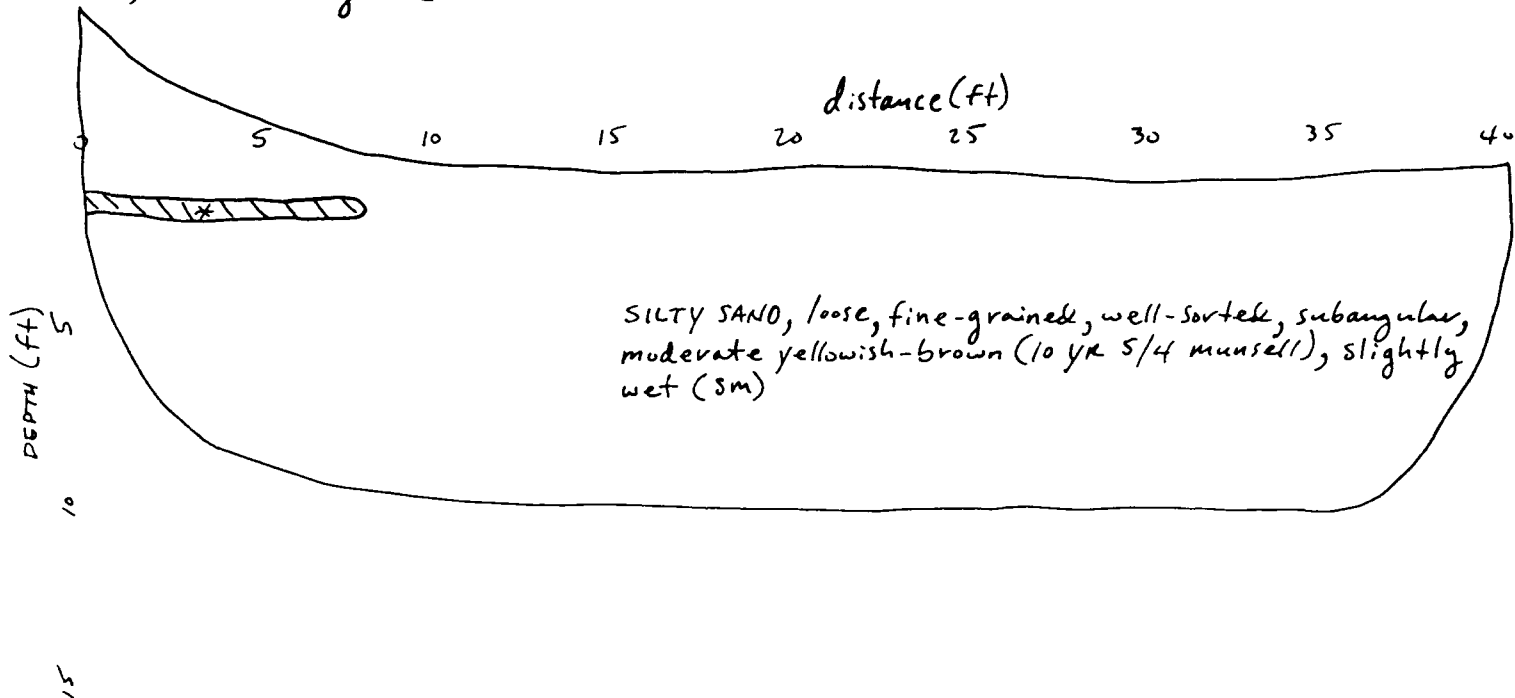
- N
- a) HNU - Background
  - b) MIB - All negative

PROJECT NAME/#: RMA task #2

TRENCH I.D.: TRENCH #8, section 36-17N, anomaly

COMPASS ORIENTATION: 348°

SCALE: 1" = 5'



\*DEBRIS: Wood, bricks, concrete rubble. (This material is very near to ground surface & is inferred to be surface dumped material).

(1)

Job No. :	2
Prepared by: S.I	
Date:	8/

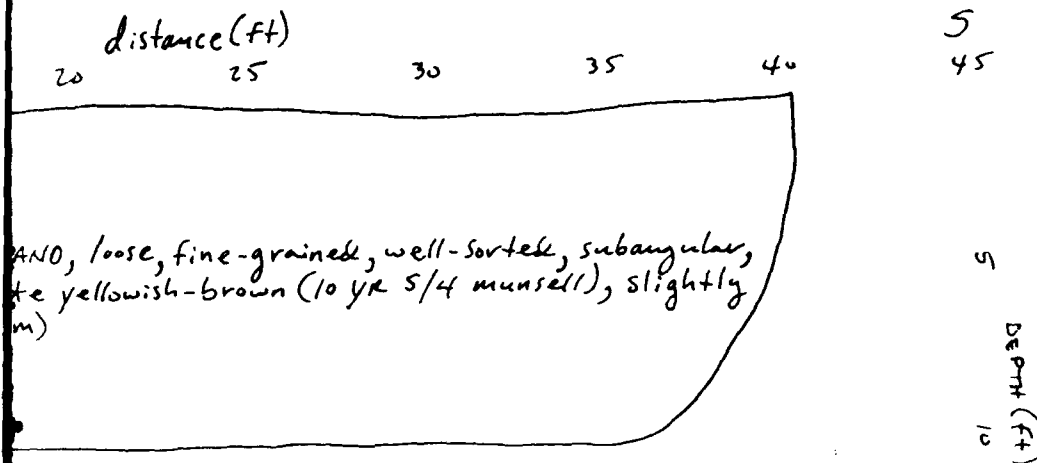


PROJECT NAME/#: RMA task #2

TRENCH I.D.: TRENCH #8, section 36-17N, anomaly area H

COMPASS ORIENTATION: 348°

SCALE: 1" = 5'



is: Wood, bricks, concrete rubble. (This material is at or very near to ground surface & is inferred to be surface dumped material).

Job No.: 22238  
Prepared by: S.E.M.  
Date: 8/14/89

Figure G-9 CROSS-SECTION  
OF TRENCH NO. 8  
SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE

DATE: 5-3-89

BACKHOE OPERATOR: CHARLIE WHARTON

TIME: 12:20

INSTRUMENT READINGS:

a) HNU - Background

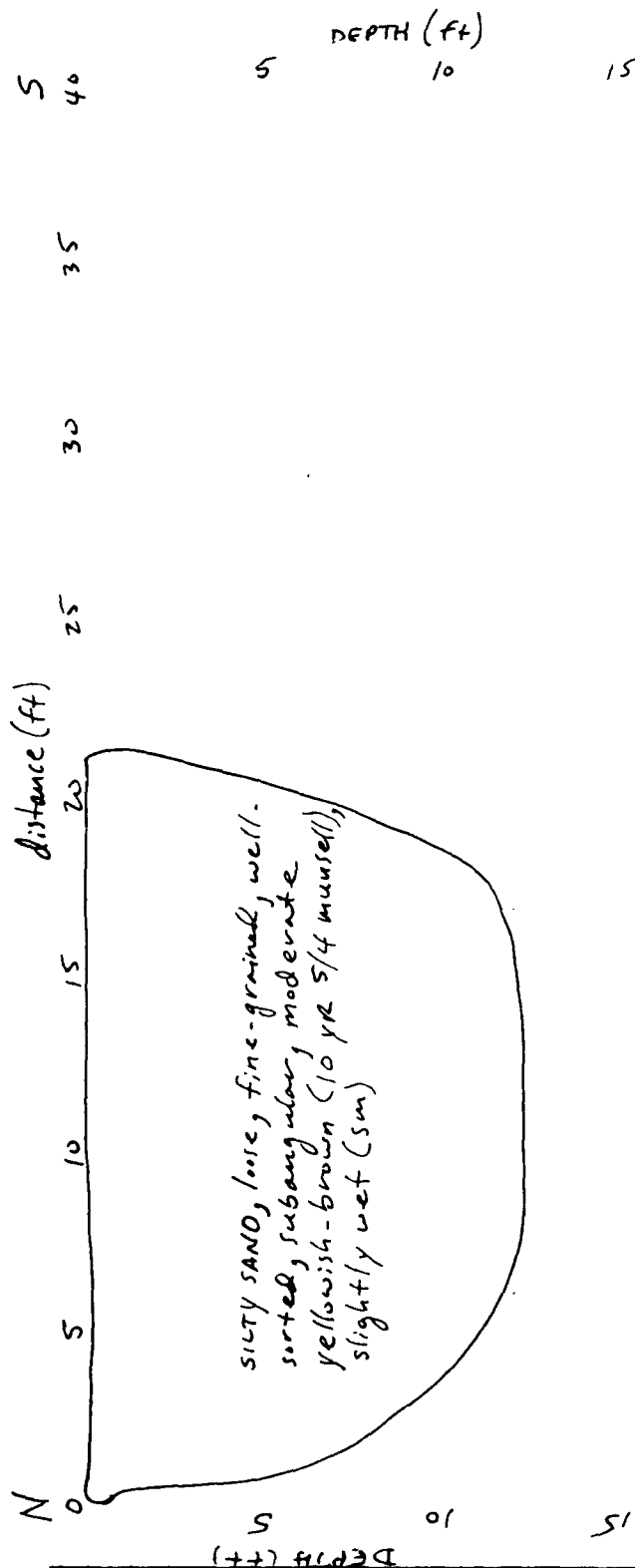
b) MIB - All negative

PROJECT NAME/#: RMA task #2

TRENCH I.D.: TRENCH 88, SECTION 36-17N, ANOMALY AREA H

COMPASS ORIENTATION: 332° NW

SCALE: 1" = 5'



Job No. : 22238

Prepared by: S.E.M.

Date: 8/14/89

Figure G-10 CROSS-SECTION  
OF TRENCH NO. 88  
SITE 36-17N  
ANOMALOUS AREA H

PAGE 1

LOGGER: STEVEN E. MORRISSETTE

DATE: 4-26-89 & 4-27-89

BAC HOE OPERATOR: CHARLIE WHARTON

TIME: 13:00 & 13:20

INSTRUMENT READINGS:

- a) HNU - 40 ppm spike at 6.0 feet, otherwise background
- b) MIC - All negative

PROJECT NAME: #1 KMA TASK 11

TRENCH I.D.: TRENCH #94, 10-11-12-13, and

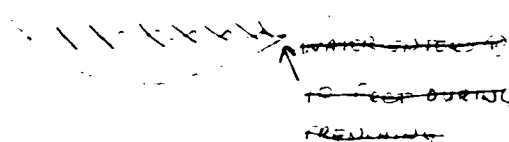
COMPASS ORIENTATION: 338°

SCALE: 1" = 5'



SAND, SILTY CLAY, firm-stiff, low-plastic,  
dark yellowish-brown (10 YR 4/2 munsell),  
with fine-grained, well sorted, subangular  
sand grains, wet (CL).

10  
5  
15



(1)

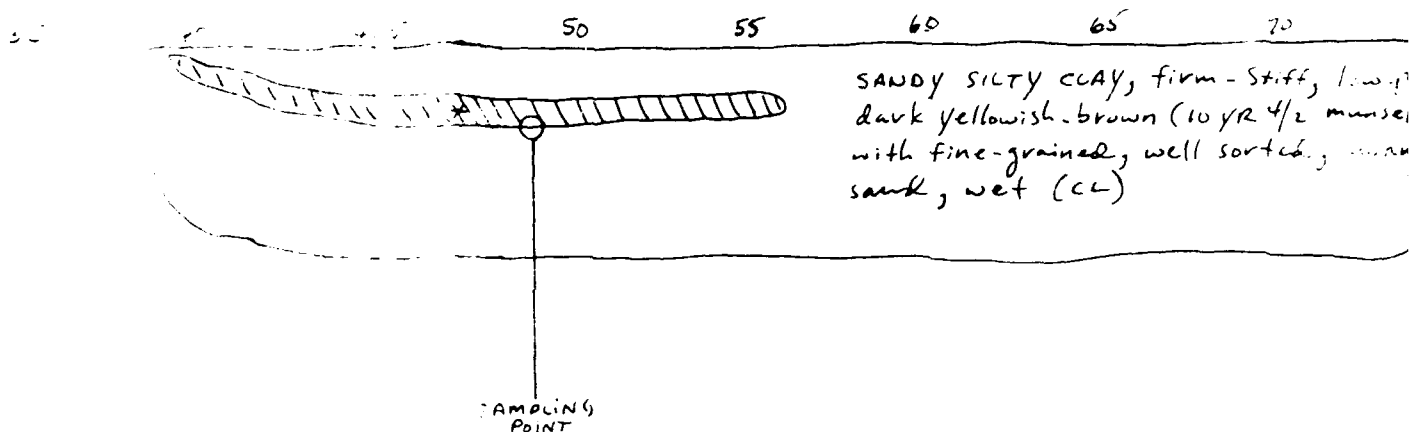
PAGE 2

NR 2  
Y-axis section 3-110, anomaly area H

LOGGER: STEVEN E. MORRISSETTE  
DATE: 4-26-89 & 4-27-89  
BACKHOE OPERATOR:  
TIME: 13:00 & 10:20

PROJECT A  
TRENCH I  
COMPASS  
SCALE: 1

distance LA



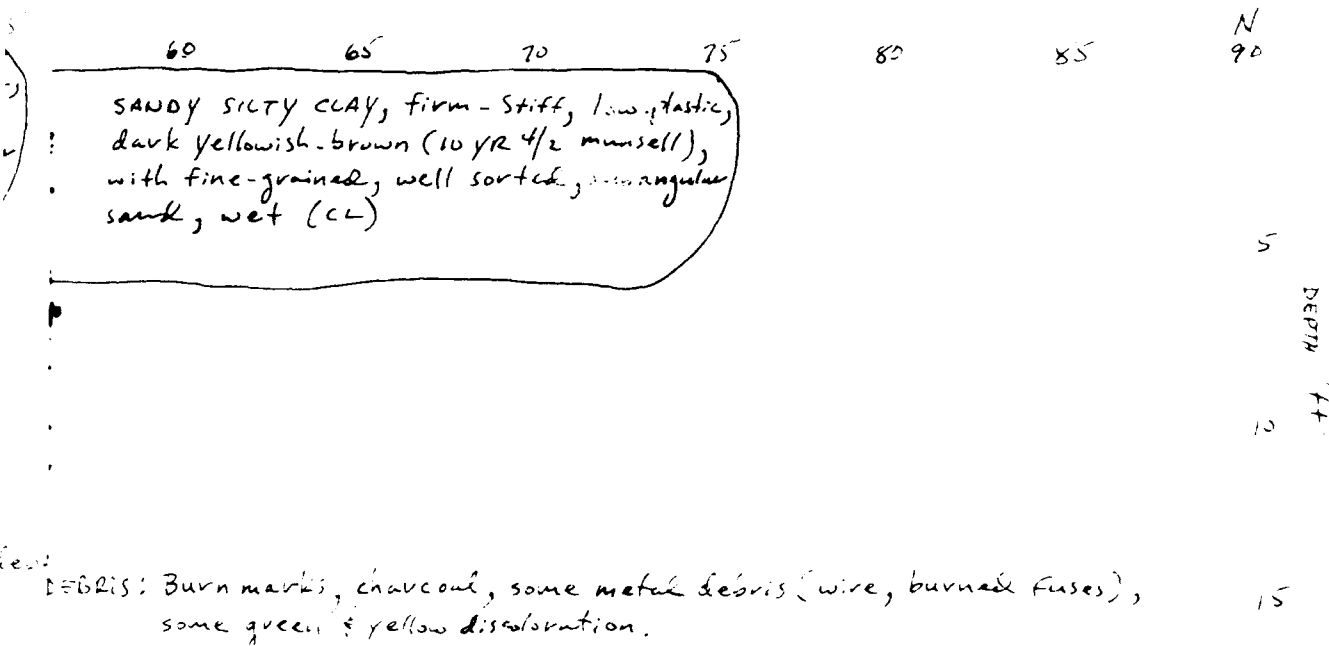
(2)

Job No. :
Prepared by :
Date :

PAGE 2

9A MORRISSETTE  
 NTA 4-27-89  
 2:  
 20

PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: 9A, SECTION 36-17N, anomaly area H  
 COMPASS ORIENTATION: 336°  
 SCALE: 1" = 5'



Job No :	22238	Figure G-11 CROSS-SECTION OF TRENCH NO. 9A SITE 36-17N ANOMALOUS AREA H
Prepared by :	S. E. M.	
Date :	8/14/89	

LOGGER: STEVEN E. MORRISSETTE

DATE: 4-26-89

BACKHOE OPERATOR: JAMES "JIGGS" ENNIS

TIME: 13:30

INSTRUMENT READINGS:

a) HNU - Background

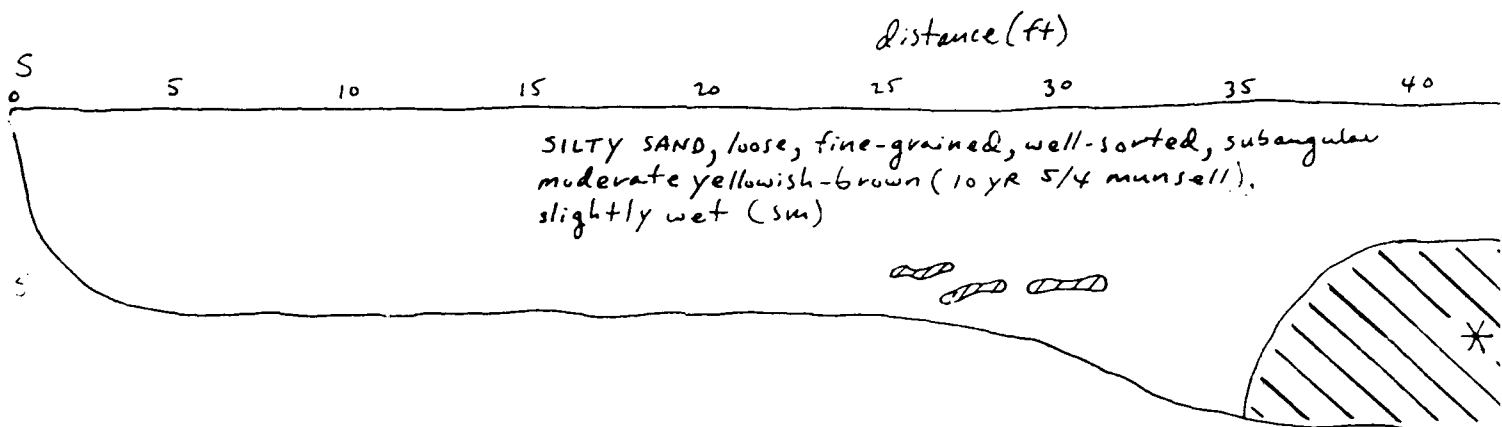
b) MIB - All negative

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH 9B, section

COMPASS ORIENTATION: 336°

SCALE: 1" = 5'

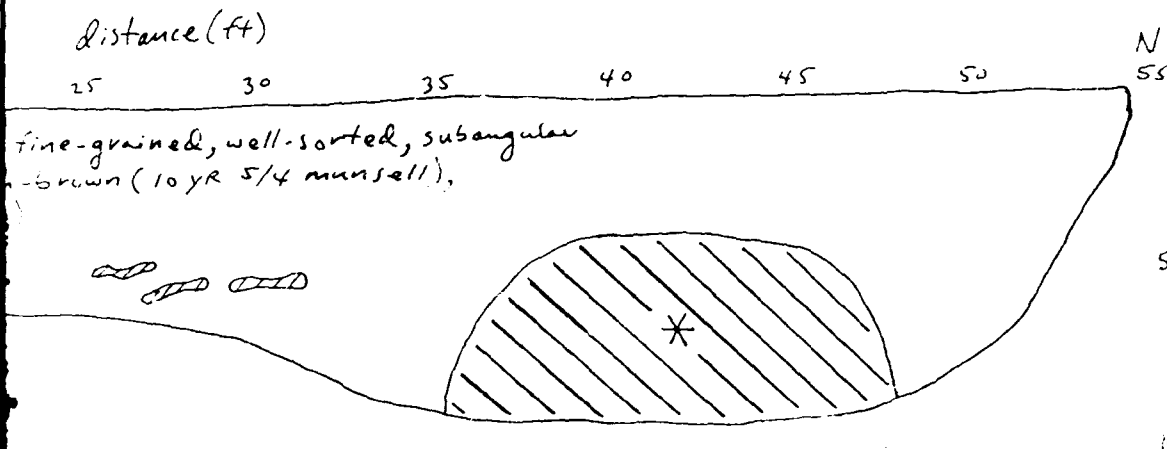


\* DEBRIS: Wood, burned wood, pieces of metal (pipes, straps), soil bottles.

— metal debris

PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: TRENCH 9B, section 36-17N, anomaly area H  
 COMPASS ORIENTATION: 336°  
 SCALE: 1" = 5'

1" ENNIS



\*-DEBRIS: Wood, burned wood, charcoal, various  
 pieces of metal (bars, 3"-4" diameter  
 pipes, straps), some rust staining, various empty  
 bottles.

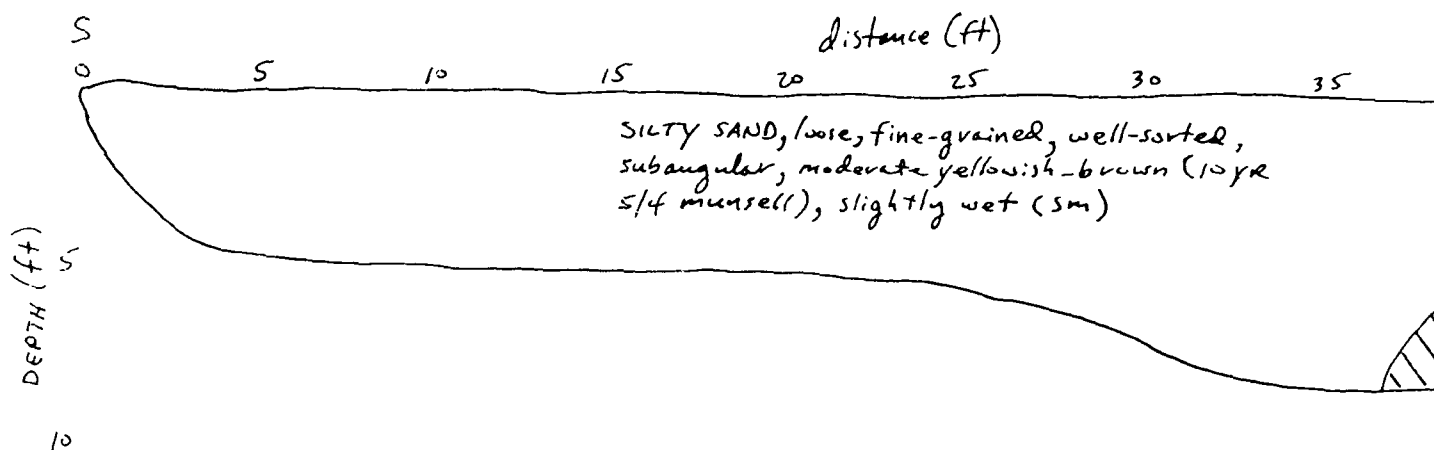
☞ - metal debris.

Job No. :	22238
Prepared by: S.E.M.	
Date:	8/14/89

Figure G-12 CROSS-SECTION  
 OF TRENCH NO. 9B  
 SITE 36-17N  
 ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE  
DATE: 4-26-89  
BACKHOE OPERATOR: JAMES "JIGGS" ENNIS  
TIME: 14:15  
INSTRUMENT READINGS:  
1) HNu - Background  
2) M18 - All negative

PROJECT NAME/#: RMA task 2  
TRENCH I.D.: 9C, SECTION 36  
COMPASS ORIENTATION: 340°  
SCALE: 1"=5'

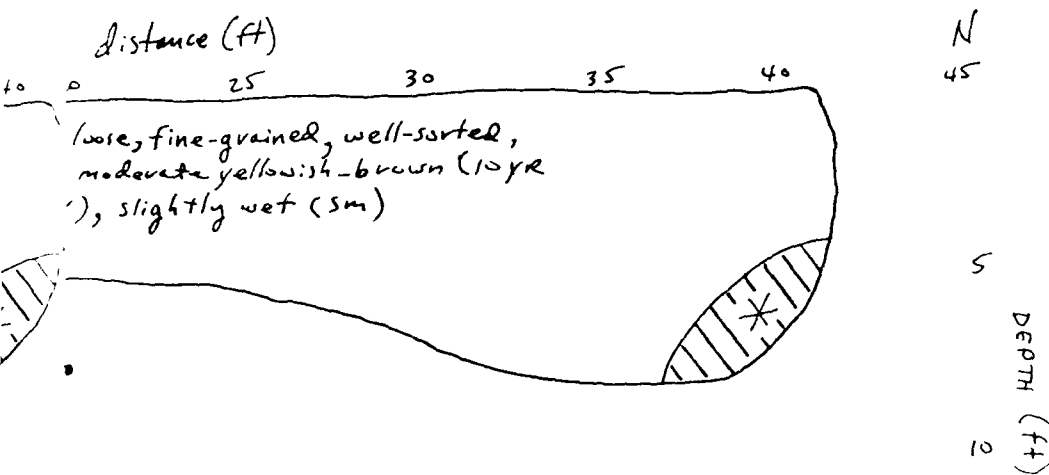


\* DEBRIS: Wood, burned wood  
various metal debr  
empty bottles.

Jot
Pre
Dat



PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: 9C, SECTION 36-17N, anomaly area H  
 COMPASS ORIENTATION: 340°  
 SCALE: 1"=5'



\* DEBRIS: Wood, burned wood, charcoal, various metal debris, some small empty bottles.

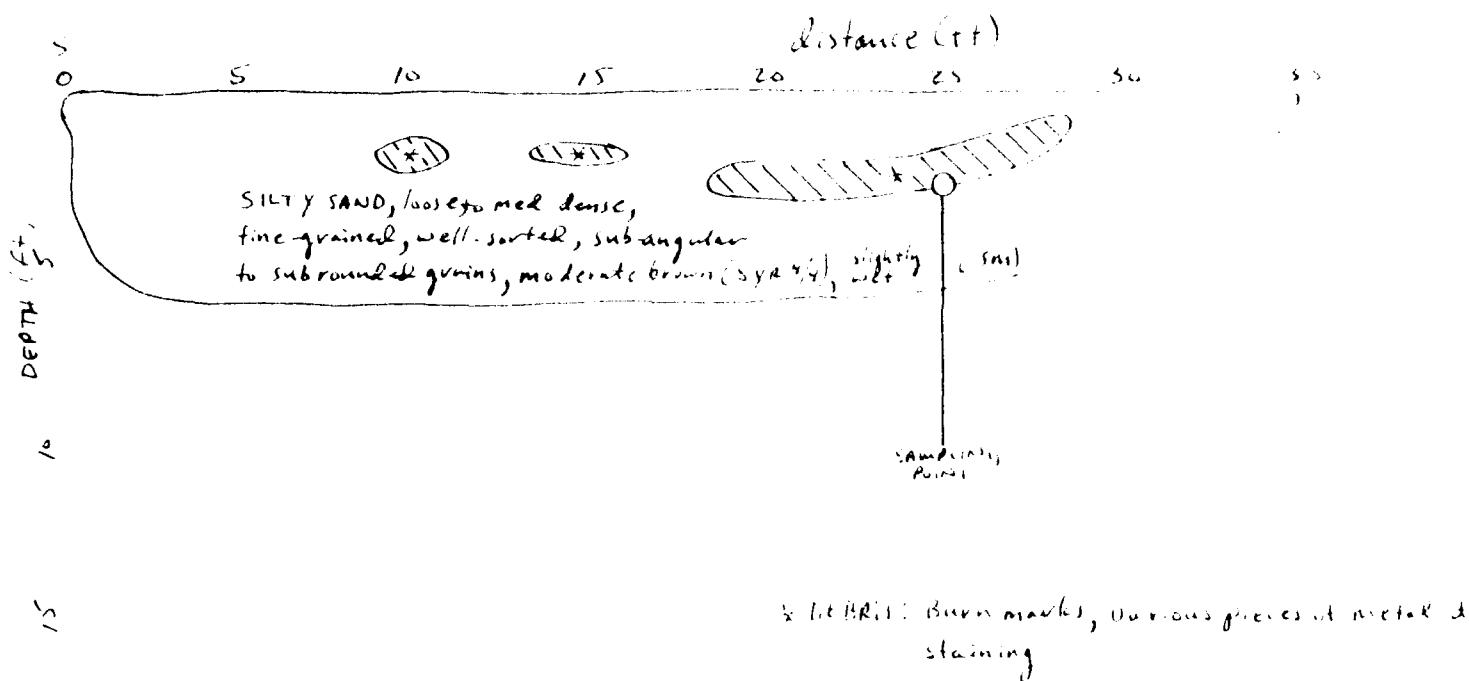
(2)

Job No. :	22238
Prepared by :	S. E. M.
Date :	8/14/89

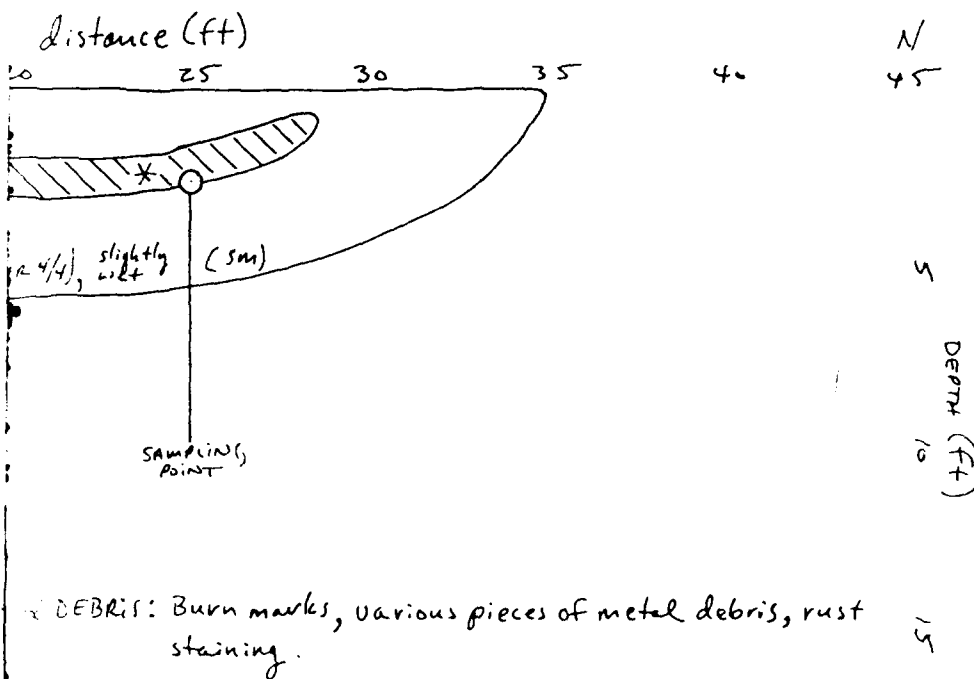
Figure G-13 CROSS-SECTION OF  
 TRENCH NO. 9C  
 SITE 36-17N  
 ANOMALOUS AREA H

LOGGER: STEVEN E. MURRASSETTE  
 DATE: 5-1-89  
 BACKHOE OPERATOR: BUD THRIFT  
 TIME: 13:45  
 INSTRUMENT READINGS:  
 a) 4Nn - Background  
 s) m13 - All negative

PROJECT NAME #1: RMA TANK 2  
 TRENCH 10' TRENCH #6, 10' DEEP  
 COMPASS ORIENTATION: 334° NW  
 SCALE: 1" = 5'



PROJECT NAME/#: RMA task 2  
 TRENCH ID: TRENCH #10, section 36-17N, anomaly area H  
 COMPASS ORIENTATION: 334°NW  
 SCALE: 1" = 5'



Job No. : 22238

Prepared by: S.E.M.

Date: 8/14/89

Figure G-14 CROSS-SECTION  
 OF TRENCH NO. 10  
 SITE 36-17N  
 ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE

DATE: 4-27-89

BACKHOE OPERATOR: BUD THRIFT

TIME: 12:30

INSTRUMENT READINGS:

a) HNu - Background

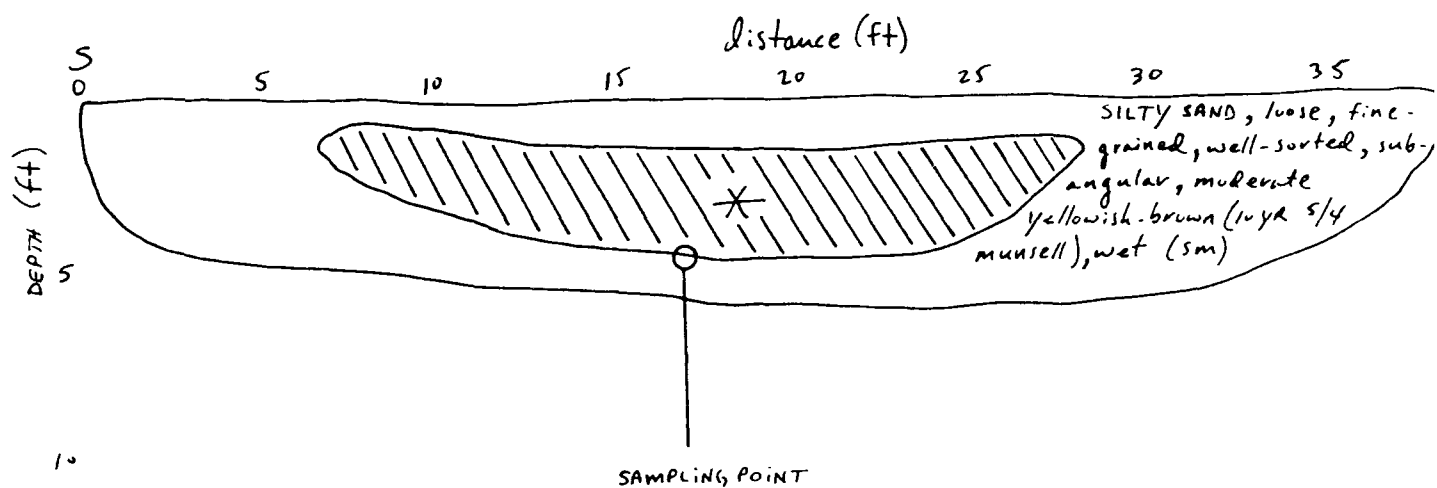
b) M18 - All negative

PROJECT NAME/#: RMA task 2

TRENCH ID: 11, section 36-17N, a

COMPASS ORIENTATION: 334° NW

SCALE: 1" = 5'



\* DEBRIS: Various pieces of scrap metal (wire, cable, burned fuse casings, metal bars & straps), some empty small glass amber bottles & clear glass vials some green & yellow discoloration, ~~silty sand matrix~~

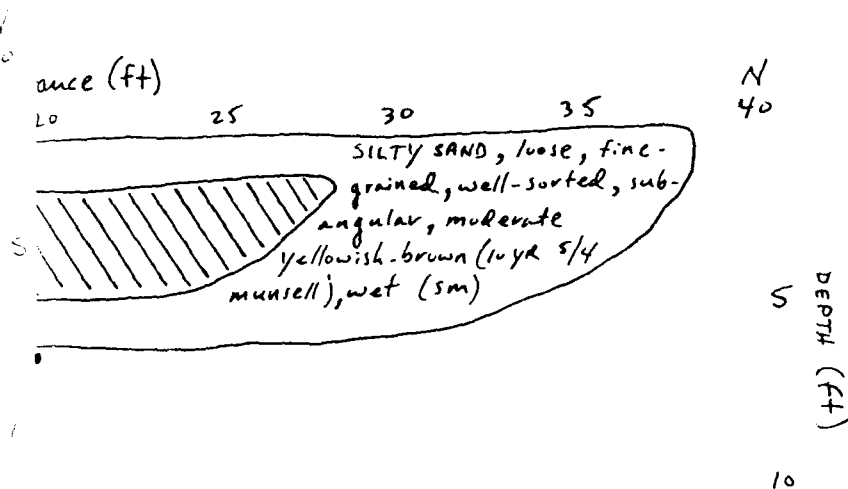
(11)

Job No.

Prepared

Date:

PROJECT NAME/#: RMA task 2  
 TRENCH ID: 11, section 36-17N, anomaly area H  
 COMPASS ORIENTATION: 334° NW  
 SCALE: 1" = 5'



Various pieces of scrap metal (wire, cable, burned fuse casings, metal bars & straps), some empty small glass amber bottles & clear glass vials, some green & yellow discoloration, ~~silty sand matrix~~

Job No. :	22238
Prepared by: S.E.M.	
Date:	8/14/89

Figure G-15 CROSS-SECTION  
 OF TRENCH NO. 11  
 SITE 36-17N  
 ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE

DATE: 5-1-85

BACKHOE OPERATOR: CHARLIE WHARTON

TIME: 08:30

INSTRUMENT READINGS:

a) HNU - Background

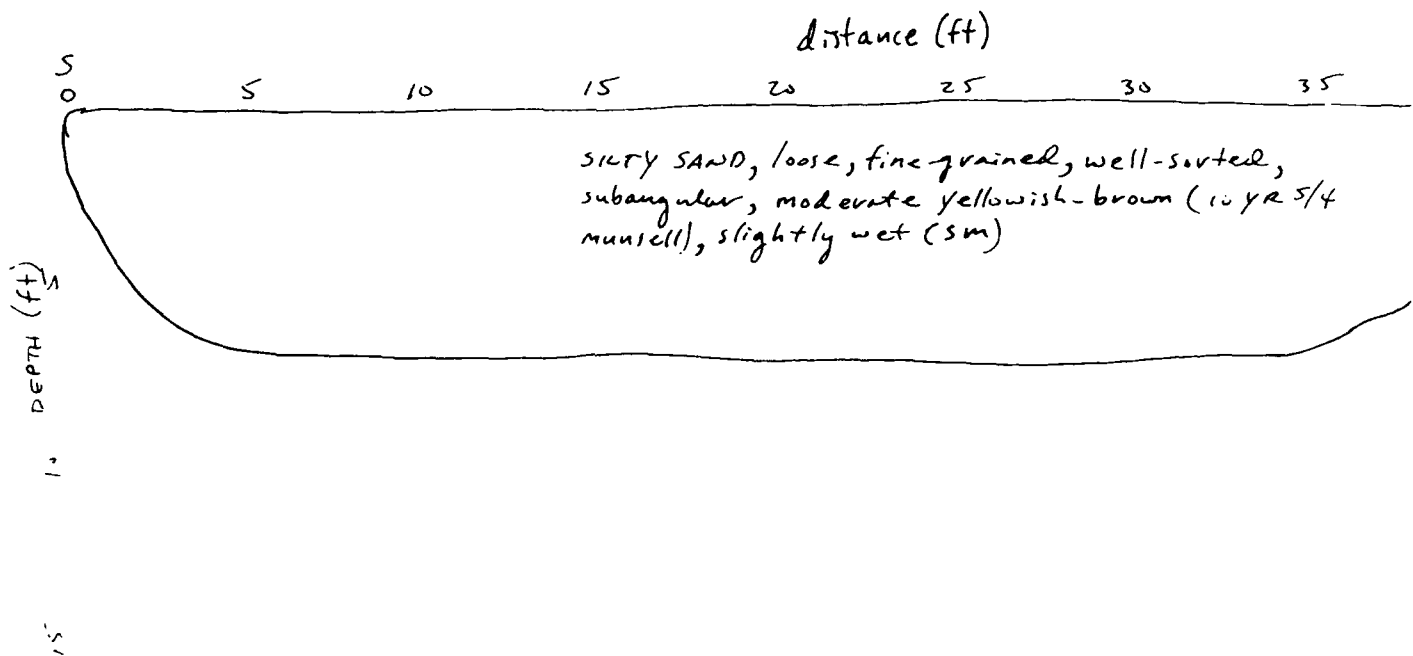
b) MIB - All negative

PROJECT NAME/#: RMA task

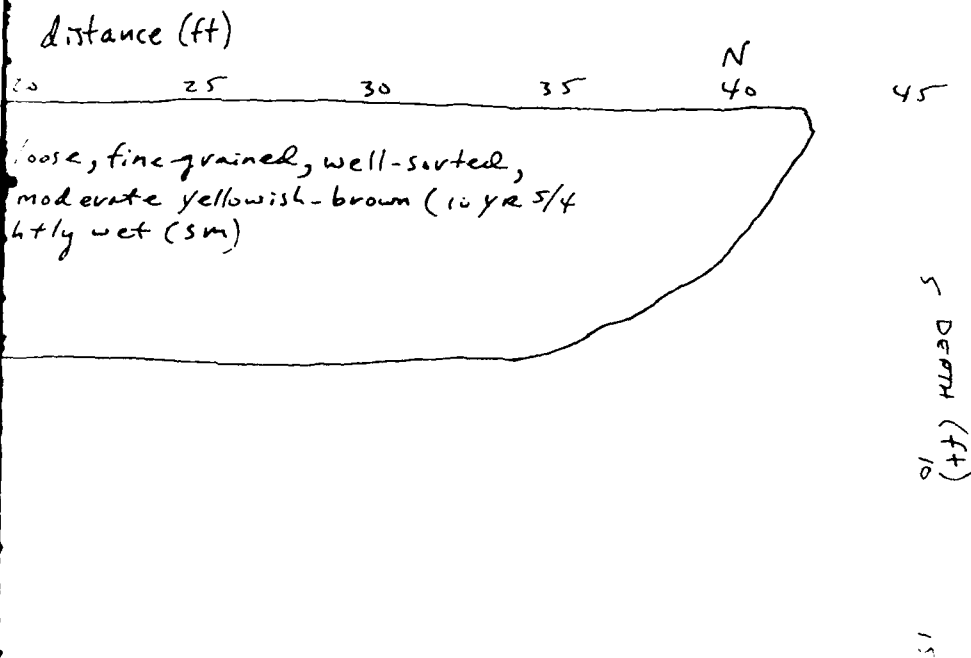
TRENCH ID: TRENCH 12, section

COMPASS ORIENTATION: 324° NW

SCALE: 1" = 5'



PROJECT NAME/#: RMA task 2  
TRENCH ID: TRENCH 12, section 36-17N, anomaly area H  
COMPASS ORIENTATION: 324° NW  
SCALE: 1" = 5'

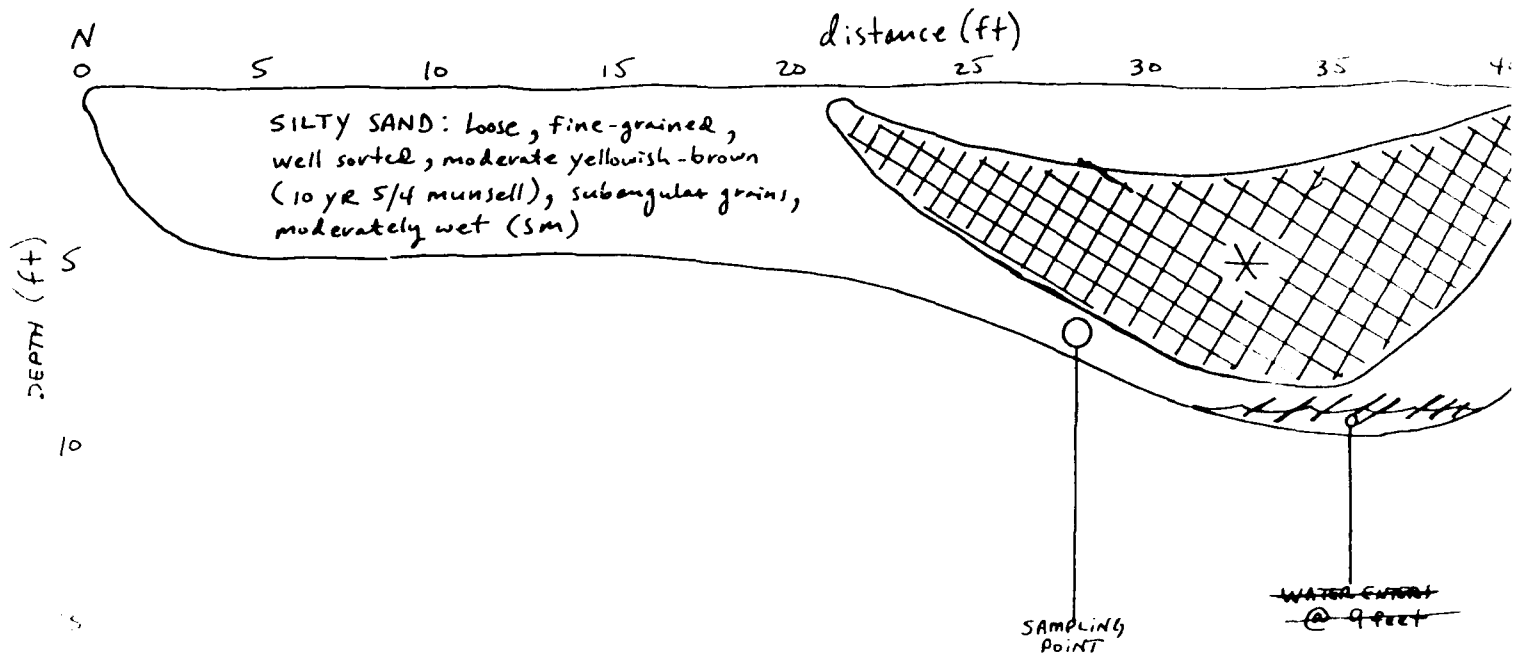


Job No. :	22238
Prepared by :	S.E.M.
Date :	8/14/89

Figure G-16 CROSS-SECTION  
OF TRENCH NO. 12  
SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE  
 DATE: 4-27-89  
 BACKHOE OPERATOR: JAMES "Jiggs" ENNIS  
 TIME: 13:30  
 INSTRUMENT READINGS:  
 a) H/Nu - Background  
 b) MIB - All negative

PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: TRENCH #13, section  
 COMPASS ORIENTATION: 336° NW  
 SCALE: 1" = 5'



\* DEBRIS: Burned wood, bricks, rock, charcoal, 4" metal pipes, pieces of scrap metal, 5  
 1/2 vials.  
 ^  
 full clear glass

Job No.
Prepared
Date

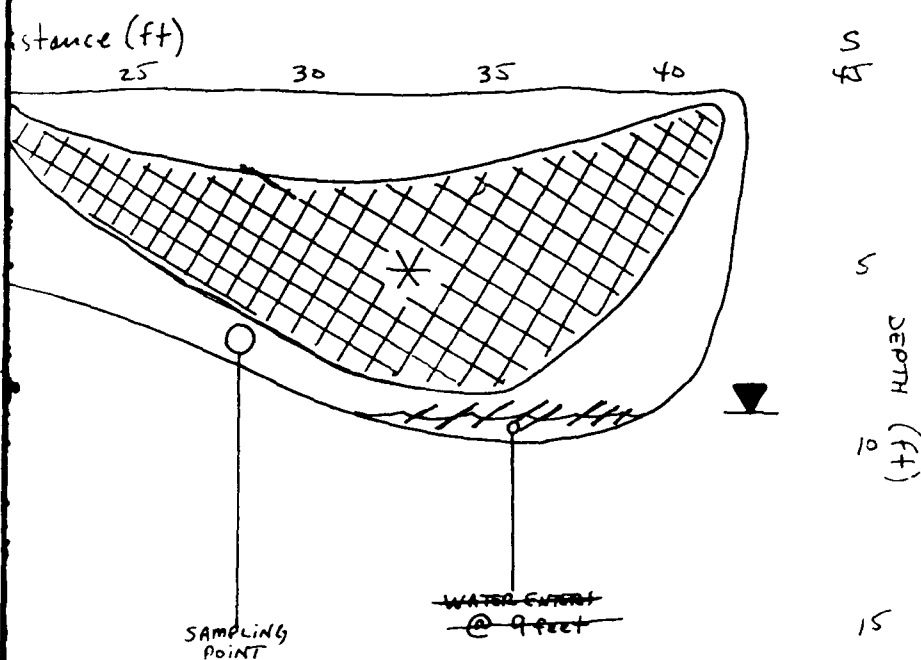


PROJECT NAME/# : RMA task 2

TRENCH I.D. : TRENCH #13, section 36-17N, anomaly area H

COMPASS ORIENTATION: 336° NW

SCALE: 1" = 5'



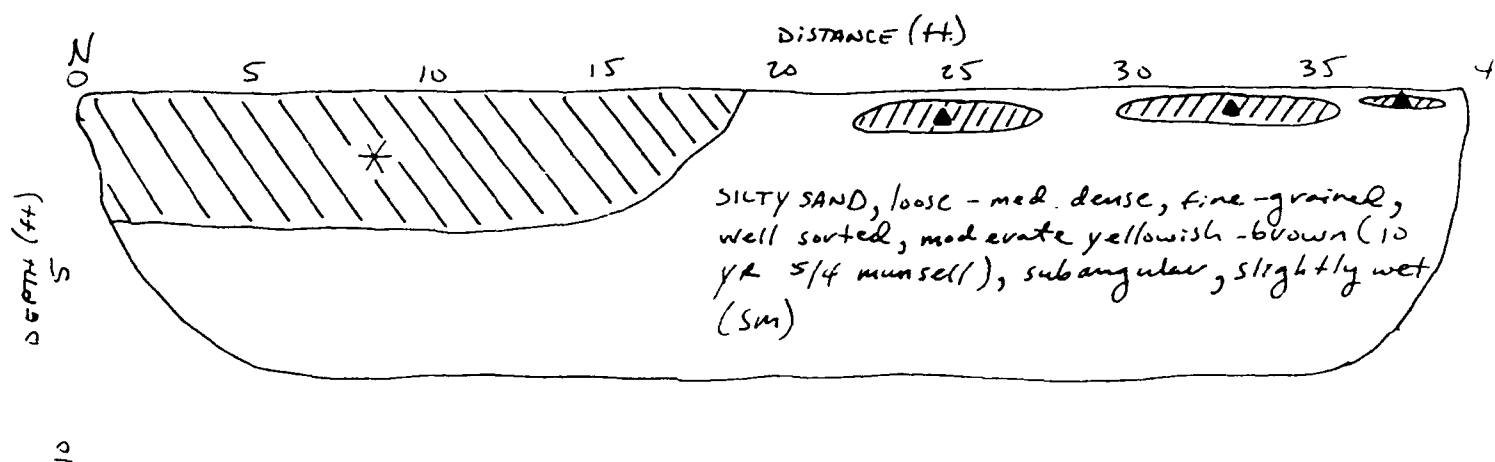
\* DEBRIS: Burned wood, bricks, rock fragments,  
charcoal, 4" metal pipes, various  
pieces of scrap metal, small bottles  
vials.  
full clear glass

Job No. :	22238
Prepared by:	S. E. M.
Date:	8/14/89

Figure G-17 CROSS-SECTION  
OF TRENCH NO. 13  
SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE  
DATE: 5-1-89  
BACKHOE OPERATOR: CHARLIE WHARTON  
TIME: 09:30  
INSTRUMENT READINGS:  
a) HNA - Background  
b) MIB - All negative

PROJECT NAME/#: RMA task 2  
TRENCH I.D.: TRENCH 14A, SECTION 36-17N, ANC  
COMPASS ORIENTATION: 344° NW  
SCALE: 1" = 5'



\* DEBRIS: LIGHT GRAY (—————), POWDERY MATERIAL (APPEARS TO BE CONCRETE DUST).

▲ DEBRIS: SURFACE BURN MARKS @ A DEPTH OF .5 ft to 2.0 ft.

(1)

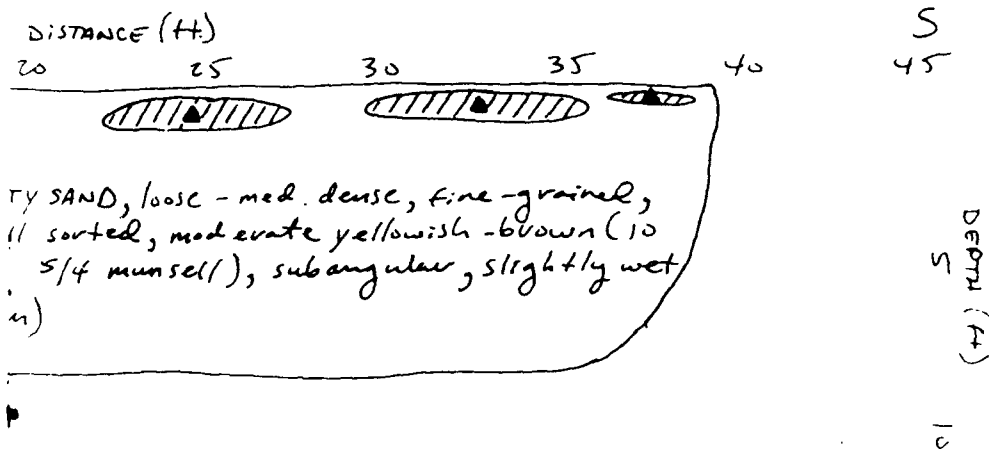
Job No.
Prepared
Date:

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH 14A, SECTION 36-17N, ANOMALY AREA H

COMPASS ORIENTATION: 344° NW

SCALE: 1" = 5'



POWDERY MATERIAL (APPEARS TO BE ...)

MARKS @ A DEPTH OF .5 ft to 2.0 ft.

Job No. : 22238

Prepared by: S.E.M.

Date: 8/14/89

Figure G-18 CROSS-SECTION  
OF TRENCH NO. 14A  
SITE 36-17N  
ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE

DATE: 5-1-89

BACKHOE OPERATOR: CHARLIE WHARTON

TIME: 10:20

INSTRUMENT READINGS:

a) HNA - Background

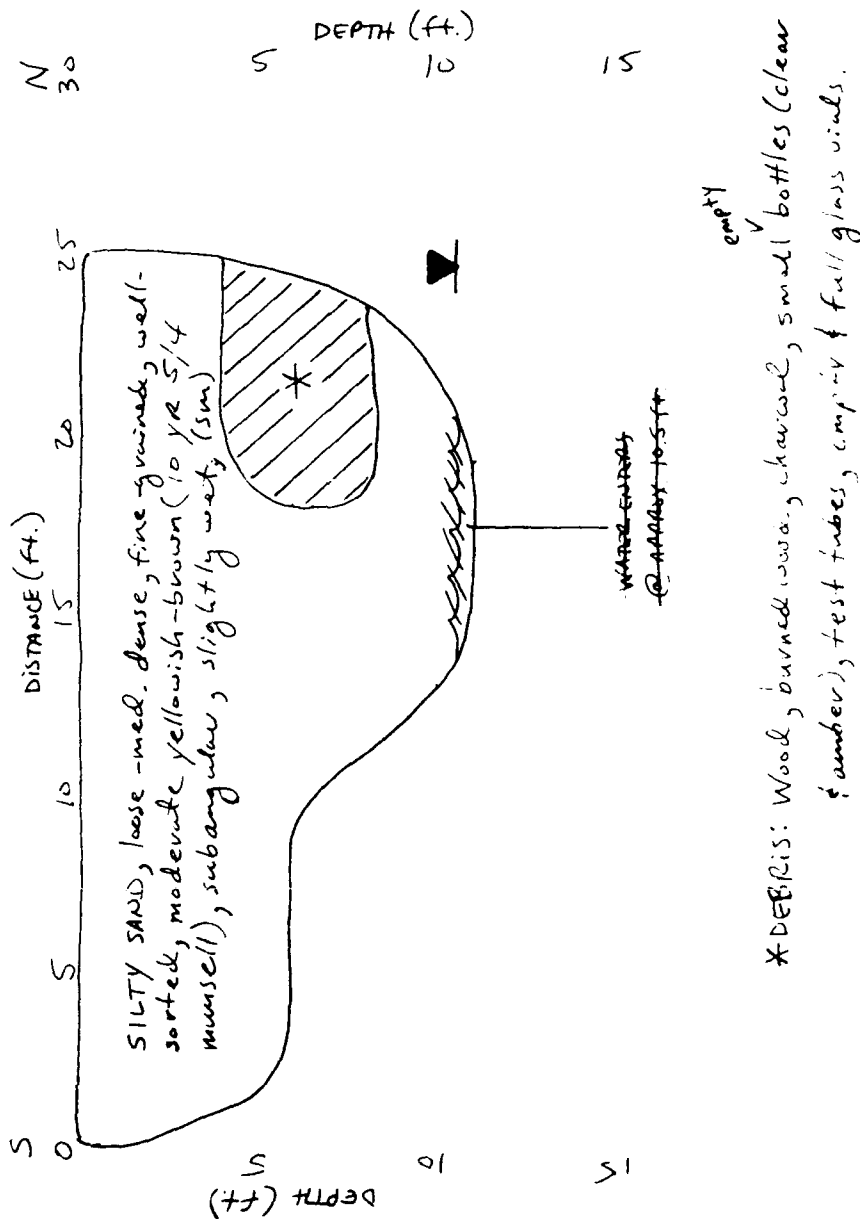
b) MIB - All negative

PROJECT NAME/#: RMA Task 2

TRENCH I.D.: TRENCH 14B, SECTION 36-17N, ANOMALY AREA H

COMPASS ORIENTATION: 336° NW

TIME: SCALE: 1" = 5'



Job No. : 22238

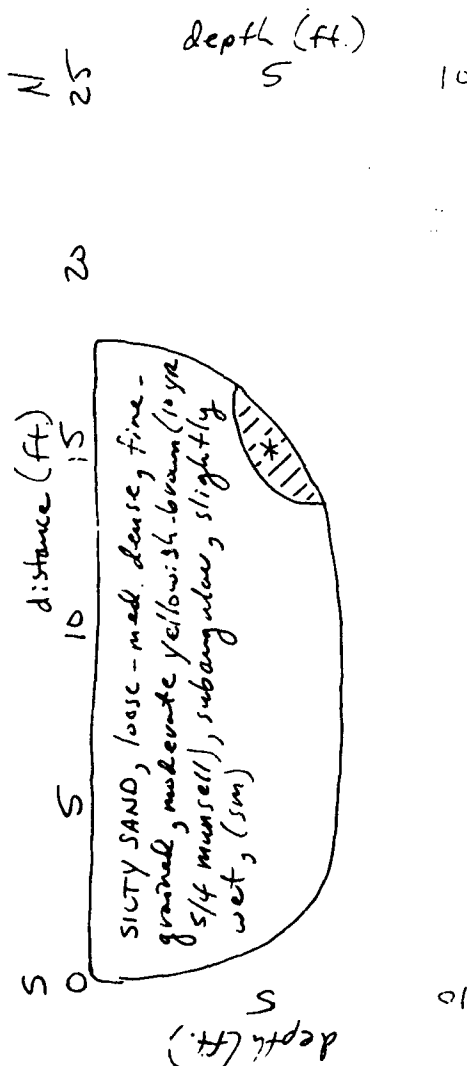
Prepared by: S. E. M

Date: 8/14/89

Figure G-19 CROSS-SECTION  
OF TRENCH NO. 14B  
SITE 36-17N  
ANOMALOUS AREA H

LOGGERS: STEVEN E. MORRISSETTE  
 DATE: 5-1-89  
 BACKHOE OPERATOR: CHARLIE WHARTON  
 TIME: 10:45  
 INSTRUMENT READINGS:  
 a) HNU - Back ground  
 b) MIB - All negative

PROJECT NAME/#: RMA task 2  
 TRENCH I.O.: TRENCH 14C, section 36-17N, anomaly area H  
 COMPASS ORIENTATION: 337° NW  
 SCALE: 1" = 5'



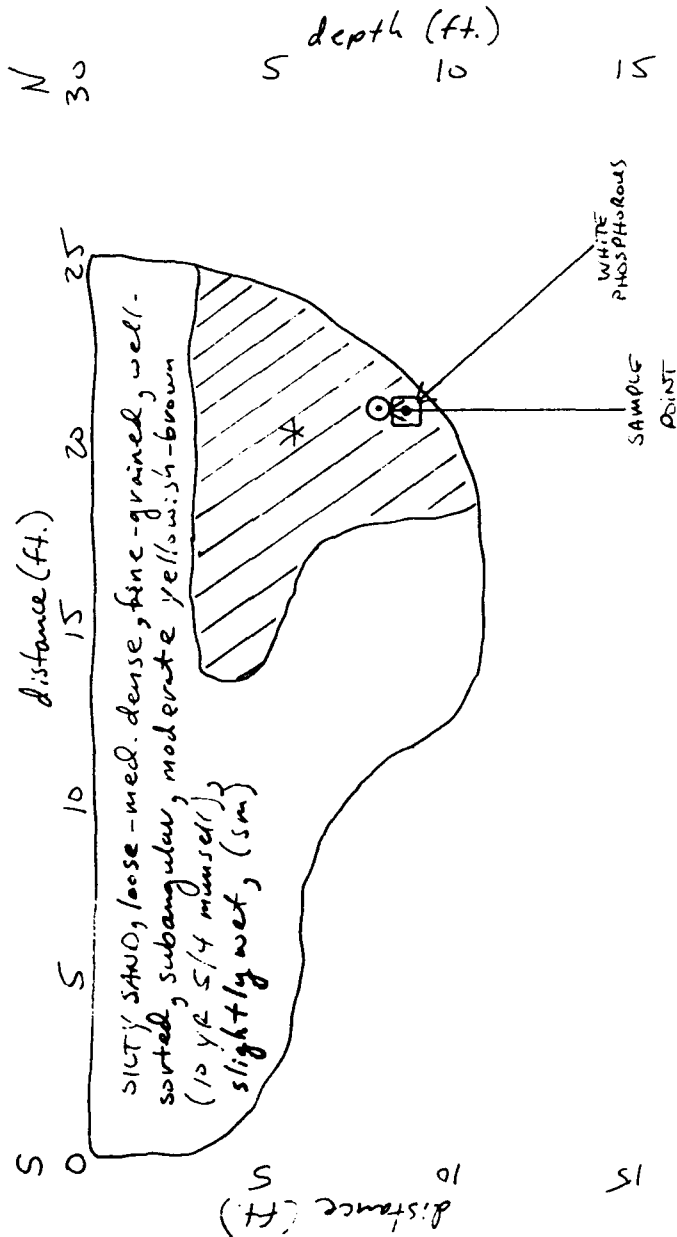
Job No. :	22238
Prepared by: S.E.M.	
Date:	8/14/89

Figure G-20 CROSS-SECTION  
 OF TRENCH NO. 14C  
 SITE 36-17N  
 ANOMALOUS AREA H

PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: TRENCH 14D, section 36-17N, anomaly area H  
 COMPASS ORIENTATION: 340° NW  
 SCALE: 1" = 5'

LOGGER: STEVEN E. MORRISSETTE  
 DATE: 5-1-89  
 BACKHOE OPERATOR: CHARLIE WHARTON  
 TIME: 11:15

INSTRUMENT READINGS:  
 a) HNU - Background  
 b) MIB - All negative



\* DEBRIS: Wood, burned wood, charcoal, metal pipe, various scrap metal, small bottles (clear & amber), test tubes, empty & full glass vials.  
 clear

Job No. :	22238
Prepared by:	S.E.M.
Date:	8/14/89

Figure G-21 CROSS-SECTION  
 OF TRENCH NO. 14D  
 SITE 36-17N  
 ANOMALOUS AREA H

LOGGER: STEVEN E. MORRISSETTE

DATE: 5-5-89

BACKHOE OPERATOR: BUD THRIFT

TIME: 10:00

INSTRUMENT READINGS:

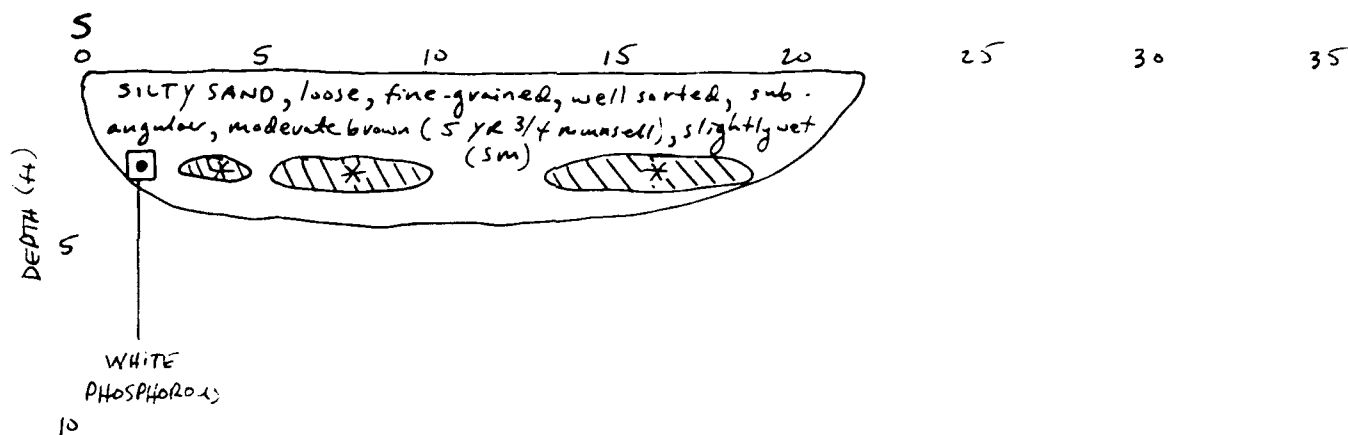
- a) H<sub>14</sub>u - 5-10 ppm around sludge, otherwise background
- b) m-10 - All negative

PROJECT NAME/#. RMA to

TRENCH I.D.: TRENCH 17, SE

COMPASS ORIENTATION: 339°

SCALE: 1" = 5'



\* DEBRIS: SOME BURNED-OUT INCENDIARY CANS & SLUDGE.

MA TUSK 2  
ON 3-17, SECTION 36-17N, west of anomaly area h  
339° NW

DISTANCE (ft)

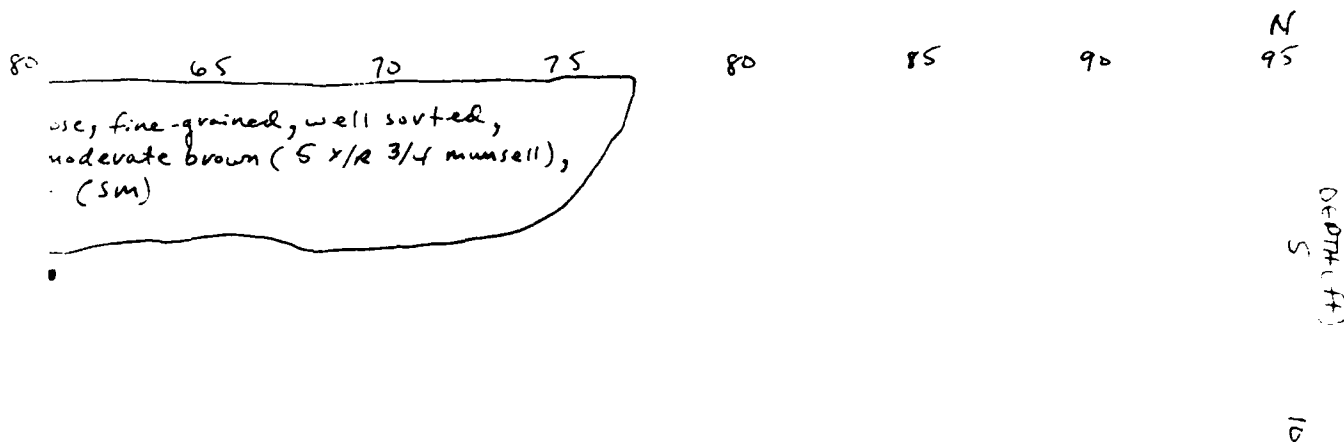
35 40 45 50 55 60 65 70 75

SILTY SAND, loose, fine-grained, well sorted,  
subangular, moderate brown (5 x/10 3/4 munsell),  
slightly wet (sm)

DARCASING 3, DARK GRAY & BLACK

Job No. :  
Prepared by  
Date :





(3)

Job No. : 22238

Prepared by: S. E. M.

Date: 8/14/89

Figure G-24 CROSS-SECTION  
OF TRENCH NO. 17  
SITE 36-17N  
ANOMALOUS AREA H

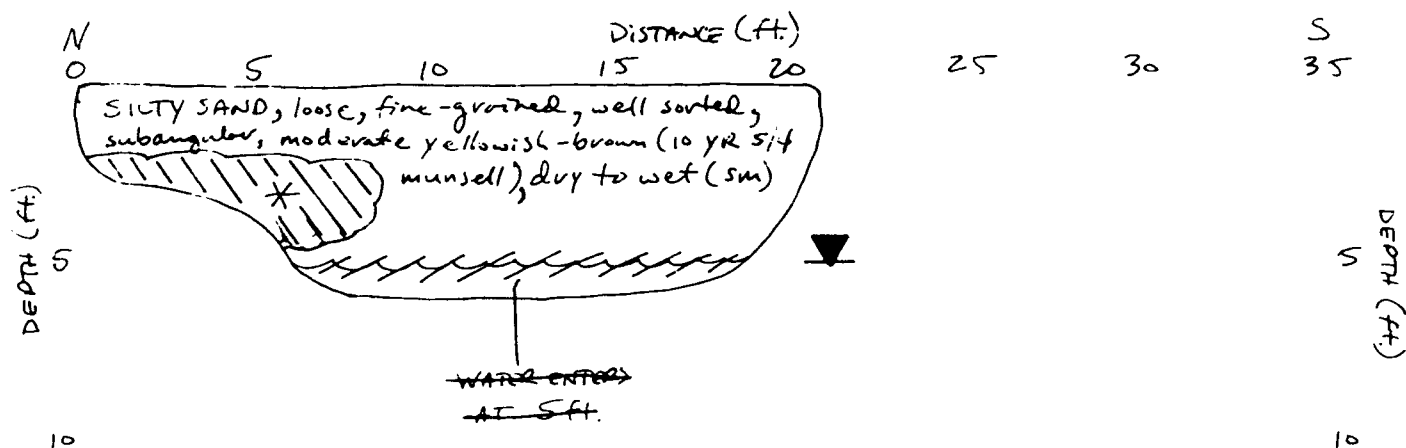
2238

E. M.

/14/8

LOGGER: STEVEN E. MORRISSETTE  
 DATE: 5-5-89  
 BACKHOE OPERATOR: CHARLIE WHARTON  
 TIME: 08:10  
 INSTRUMENT READINGS:  
 a) HNu - background  
 b) MIB - All negative

PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: TRENCH 16, SECTION 36-17N,  
 COMPASS ORIENTATION: 344° NW  
 SCALE: 1" = 5'



\* DEBRIS: LARGE PIECES OF CONCRETE RUBBLE, BRICKS, SOME WIRE.



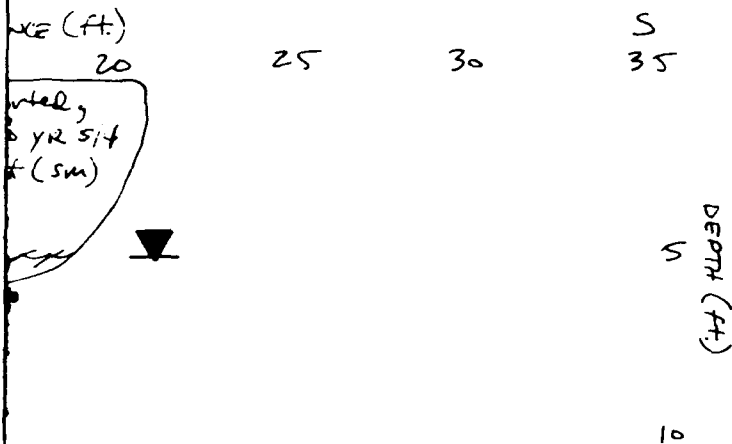
Job No. :	222
Prepared by: S.E.M.	
Date:	8/14

PROJECT NAME/#: RMA task 2

TRENCH I.D.: TRENCH 16, SECTION 36-17N, West of ANOM. AREA H

COMPASS ORIENTATION: 344° NW

SCALE: 1" = 5'



Job No. : 22238

Prepared by: S.E.M.

Date: 8/14/89

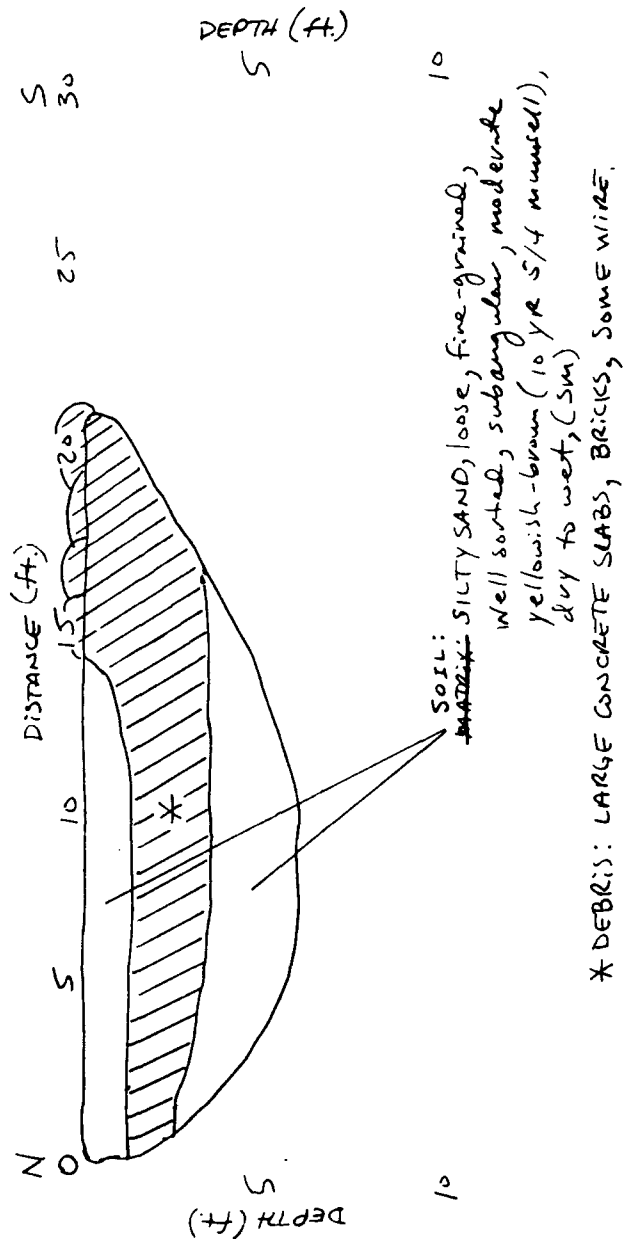
Figure G-23 CROSS-SECTION  
OF TRENCH NO. 16

SITE 36-17N  
WEST OF ANOMALOUS AREA H

(2)

PROJECT NAME/# : RMA task 2  
 TRENCH I.D. : TRENCH 15, SECTION 36-17N, west of ANOM. area H  
 COMPASS ORIENTATION : 341° NW  
 SCALE : 1" = 5'

LOGGER: STEVEN E. MORRISSETTE  
 DATE: 5-5-89  
 BACKHOE OPERATOR: CHARLIE WHARTON  
 TIME: 07:50  
 INSTRUMENT READINGS:  
 a) HNA - Background  
 b) MIB - All negative



Job No. : 22238

Prepared by: S.E.M.

Date: 8/14/89

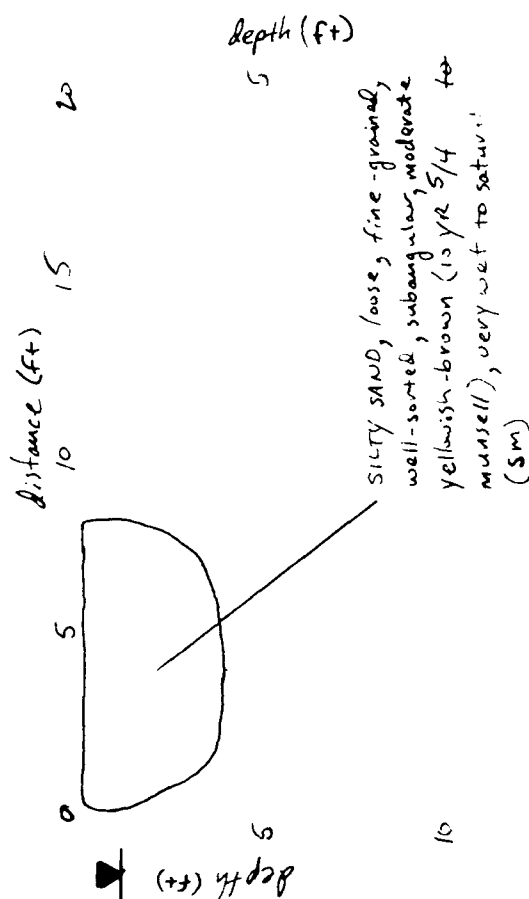
Figure G-22 CROSS-SECTION  
 OF TRENCH NO. 15  
 SITE 36-17N  
 WEST OF ANOMALOUS AREA H

PROJECT NAME/#: RMA task 2  
 TRENCH I.D.: TRENCH 18, section 36-17N, west of anomaly area H  
 COMPASS ORIENTATION: 3400  
 SCALE: 1" = 5'

LOGGER: STEVEN E. MORRISSETTE  
 DATE: MAY 5, 1989  
 BACKHOE OPERATOR: BUD THRIFT  
 TIME: 08:30

## INSTRUMENT READINGS:

- a) H<sub>1</sub>N<sub>1</sub> - background
- b) M18 - All negative



NOTE: Material becomes saturated approximately 1.0 foot  
 under the surface

Job No. : 22238

Prepared by: S. E. M.

Date: 8/14/89

Figure G-25 CROSS-SECTION  
 OF TRENCH NO. 18  
 SITE 36-17N  
 WEST OF ANOMALOUS AREA H

**APPENDIX H**  
**QA/QC DATA ANALYSIS**

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APPENDIX H  
QA/QC DATA ANALYSIS

---

QUALITY ASSURANCE - APPENDIX H

Trip Blanks - A trip blank was shipped with every cooler of samples sent to the laboratory.

A total of 29 trip blanks were analyzed for volatile organic compounds (VOC). Table H-1 is a complete listing of trip blanks from this program. Five of the trip blanks indicated the presence of chloroform and two of those eight also indicated the presence of acetone (ACET). The average concentration of chloroform detected in the five trip blanks was 46.6  $\mu\text{g/L}$ . The range in concentration reported in the trip blanks was from 2.3 to 66  $\mu\text{g/L}$ . The concentrations of chloroform and acetone in the samples corresponding to the trip blanks with detections of chloroform and/or acetone was less than the method detection limits for those analytes.

The source of the chloroform is believed to be the sampling crew. Chloroform for Army agent screening samples was with the sample crew for 7 out of 8 of the sampling activities that chloroform was indicated in the trip blank.

Field Blanks - Field blanks were collected at the rate of 1 per 20 water samples per area. A total of four field blanks were collected during the sampling program. Table H-2 is a complete listing of field blanks from this program. Two of the four field blanks indicated the presence of sodium. No other analytes were detected in the field blanks. The concentration of sodium indicated in the field blanks was 1,950 and 3,100  $\mu\text{g/L}$  in samples WC 89G-005 and WC 55G005, respectively. Very high concentrations of sodium were indicated in both of the associated groundwater samples, which were both sampled immediately prior to collecting the field blanks. The concentration of sodium in sample WC 89G001 was 1,800,000  $\mu\text{g/L}$  and in sample WC 55G001 it was 2,200,000  $\mu\text{g/L}$ . Based on the extremely high concentration in the groundwater samples it is likely that the concentration detected in the field blanks is a residual from the preceding groundwater sampling event.

## Woodward-Clyde Consultants

### Decontamination Rinsates

A total of 40 decontamination rinsates were collected during the field sampling program. Table H-3 is a complete listing of decontamination rinsates from the program. Decontamination rinsates were taken from each of the sample collection activities as listed below.

<u>Sample Activity/Media</u>	<u>Number of Decontamination Rinsates</u>
Groundwater Sampling	19
Boring Installation/Soil	11
Exploratory Trenching/Waste	7
ISV Sample Collection/Waste	<u>3</u>
	40

Target analytes were detected in 23 out of 40 of the decontamination rinsates indicating that the decontamination procedures were not perfect. However, the concentration of analyte detected in the rinsate was generally less than 1 percent of the concentration detected in the associated samples indicating that decontamination was adequate for this program.

### Duplicates

A total of 20 duplicate samples were collected during the field program. Table H-4 is a complete listing of paired sample and duplicate data. Duplicates were collected from each sample media as listed below.

<u>Media</u>	<u>Total Samples</u>	<u>Number of Duplicates</u>
Groundwater	35	6
Soil	47	11
Waste	<u>18</u>	<u>3</u>
	100	20



## **Woodward-Clyde Consultants**

Comparative evaluation of the sample and duplicate analytical results indicates very good correlation and reproducibility for paired data in each of the media. The high degree of correlation indicates that the samples are representative of the actual condition at the site.

COMPLETE LISTING OF TRIP BLANKS

(DMA DATABASE)

Volatiles	Semi-Volatiles	GCs	OCPS	DBCP	DIBP/DMB	GCUS	IMP/MPA	IAT/SPIC	F I MB/CUTY	F I ICP
Field number - WC340004	Site ID - 01504		Site type - WELL	Sample Date - 89151	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC340034	Site ID - 34054		Site type - WELL	Sample Date - 89164	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC340004	Site ID - 34056		Site type - WELL	Sample Date - 89163	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC350004	Site ID - 34075		Site type - WELL	Sample Date - 89108	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC350034	Site ID - 34075		Site type - WELL	Sample Date - 89166	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC350004	Site ID - 34076		Site type - WELL	Sample Date - 89165	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC350004	Site ID - 34183		Site type - WELL	Sample Date - 89131	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC370004	Site ID - 34187		Site type - WELL	Sample Date - 89159	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - WC370004	Site ID - 34187		Site type - WELL	Sample Date - 89124	(Julian)					
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
111TCE LT	1.0000 N.A.									
112TCE LT	1.0000									
11DCLE LT	1.0000									
11DCLE LT	1.0000									
120CE LT	5.0000									

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, WASS, CPH - UCC)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

DIO H-1  
COMPLETE LISTING OF TRIP BLANKS

(RMA DATABASE)

Volatiles	Semi-volatiles	OSCS	OCPs	DBCP	DIBD/DIBD	OSCHS	IMPA/MPA	IATSONIC	F I MERCURY	F I ICP
120CL LT 1.0000										
120CL LT 1.0000										
130CL <sub>6</sub> LT 1.0000										
130CP LT 4.8000										
130MS LT 1.0000										
2CLEVE LT 3.5000										
ACEIT LT 8.0000										
ACRYLO LT 8.4000										
BROCLM LT 1.0000										
CHOCCL LT 12.0000										
CHOCCL LT 8.0000										
CHAS LT 1.0000										
COLJF LT 1.0000										
COLA LT 1.0000										
CHCL2 LT 1.0000										
CHUR LT 14.0000										
CHCL LT 1.2000										
CHOC LT 11.0000										
CHCL3 23.0000										
CLOMS LT 1.0000										
DIRCLM LT 1.0000										
DCLB LT 2.0000										
ETOMS LT 1.0000										
MECHS LT 1.0000										
MEK LT 10.0000										
MIBK LT 1.4000										
TCLFA LT 1.5000										
TCLLE LT 1.0000										
TCLLE LT 1.0000										
XYLEN LT 2.0000										

----- Field number - W090014 Site ID - 36189 Site type - WELL Sample Date - 89158 (Julian)

L.T. N.A. N.A. N.A. N.A. N.A. N.A. N.A. N.A.

----- Field number - W090014 Site ID - 36190 Site type - BORE Sample Date - 89108 (Julian)

L.T. N.A. N.A. N.A. N.A. N.A. N.A. N.A. N.A.

----- Field number - W090044 Site ID - 36190 Site type - BORE Sample Date - 89110 (Julian)

L.T. N.A. N.A. N.A. N.A. N.A. N.A. N.A. N.A.

L.T. - less than (value) N.A. - NOT ANALYZED R - REJECTED-OUT OF CONTROL UNITS OF MEASUREMENT - SITE TYPE (WELL - UCL) and (BORE, WASS, CPMH - UCL)

F - Indicates filtered sample analysis See Appendix K for explanation of field number

Site H-1  
COMPLETE LISTING OF TRIP BLANKS

(RMA Database)

Volatiles	Site ID	OSCS	OCPS	BORE	SAMPLE DATE	OSCS	DWD/DMD	OSCS	IMPA/MPA	ATSONIC	F I MERCURY	F I ICP
Field number - W310204	Site ID - 36191				SAMPLE DATE - 89163							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W322194	Site ID - 36192				SAMPLE DATE - 89137							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W333004	Site ID - 36193				SAMPLE DATE - 89136							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W340204	Site ID - 36194				SAMPLE DATE - 89194							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W345004	Site ID - 36194				SAMPLE DATE - 89166							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W313004	Site ID - 36TRENCH01				SAMPLE DATE - 89142							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W325004	Site ID - 36TRENCH02				SAMPLE DATE - 89143							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W329004	Site ID - 36TRENCH02				SAMPLE DATE - 89115							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Field number - W349004	Site ID - 36TRENCH09				SAMPLE DATE - 89117							
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
111ICE LT 1.0000	N.A.											
112ICE LT 1.0000												
110ICE LT 1.0000												
110CLE LT 1.0000												
120ICE LT 5.0000												

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control UNITS OF MEASUREMENT - SITE TYPE (WELL - UCL) AND (BORE, MASS, CPM - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

bio M-1  
COMPLETE LISTING OF TRIP BLANKS

10/28/2004 (CONT'D)										
Volatiles	Semi-Volatiles	GC/MS	GC/MS	DICP	DIBP/DBP	GC/MS	THPA/MPA	IArsenic	F Mercury	F ICP Metals
120CL1 LT	1.0000									g
120CL2 LT	1.0000									g
120CL3 LT	1.0000									g
120CL4 LT	1.0000									g
120CL5 LT	1.0000									g
120CL6 LT	1.0000									g
120CL7 LT	1.0000									g
120CL8 LT	1.0000									g
120CL9 LT	1.0000									g
120CL10 LT	1.0000									g
120CL11 LT	1.0000									g
120CL12 LT	1.0000									g
120CL13 LT	1.0000									g
120CL14 LT	1.0000									g
120CL15 LT	1.0000									g
120CL16 LT	1.0000									g
120CL17 LT	1.0000									g
120CL18 LT	1.0000									g
120CL19 LT	1.0000									g
120CL20 LT	1.0000									g
120CL21 LT	1.0000									g
120CL22 LT	1.0000									g
120CL23 LT	1.0000									g
120CL24 LT	1.0000									g
120CL25 LT	1.0000									g
120CL26 LT	1.0000									g
120CL27 LT	1.0000									g
120CL28 LT	1.0000									g
120CL29 LT	1.0000									g
120CL30 LT	1.0000									g
120CL31 LT	1.0000									g
120CL32 LT	1.0000									g
120CL33 LT	1.0000									g
120CL34 LT	1.0000									g
120CL35 LT	1.0000									g
120CL36 LT	1.0000									g
120CL37 LT	1.0000									g
120CL38 LT	1.0000									g
120CL39 LT	1.0000									g
120CL40 LT	1.0000									g
120CL41 LT	1.0000									g
120CL42 LT	1.0000									g
120CL43 LT	1.0000									g
120CL44 LT	1.0000									g
120CL45 LT	1.0000									g
120CL46 LT	1.0000									g
120CL47 LT	1.0000									g
120CL48 LT	1.0000									g
120CL49 LT	1.0000									g
120CL50 LT	1.0000									g

Field Number	Site ID	Site Type	Sample Date	Julian
WC16M004	36 TRENCH	6	09130	(Julian)

[illegible]

L.T. = less than (value)      N.A. = NOT Analyzed  
F = indicates filtered sample analysis  
R = rejected-out of control      Units of measurement - Site type (Well = UCL) and (Bore, Mass, CPM = UCL)  
See Appendix K for explanation of Field Number

**Table H-1**  
**COMPLETE LISTING OF TRIP BLANKS**

[illegible]

Table H-1  
COMPLETE LISTING OF TRIP BLANKS

(RMA Database)

Volatiles	Semi-Volatiles	OSCS	OCPS	DOCP	DIMP/TMPO	OSCS	IMPA/MPA	IATSONIC	F I METCUTY	F I ICP
WCISW14 (cont'd)										
130CLB LT	1.0000									
130CP LT	4.0000									
130MB LT	1.0000									
20LEVE LT	3.5000									
ACE7	109.0000									
ACRYLO LT	8.0000									
BROCLM LT	1.0000									
CHOCCL LT	12.0000									
CHOCCL LT	8.0000									
CH4 LT	1.0000									
CCL3F LT	1.0000									
CCL4 LT	1.0000									
CHOCCL2 LT	1.0000									
CHOCCL LT	14.0000									
CHOCCL LT	1.2000									
CHOCCL LT	11.0000									
CHOCCL	47.0000									
CLOMB LT	1.0000									
DBROCLM LT	1.0000									
DCLB LT	2.0000									
ETOMAS LT	1.0000									
RECOMAS LT	1.0000									
HEK LT	10.0000									
MIK LT	1.0000									
TCLFA LT	1.5000									
TCLFE LT	1.0000									
TCLFE LT	1.0000									
WVLEH LT	2.0000									

Field Number - WCISW14 Site ID - M-115W14 Site Type - MASS Sample Date - 8/12/80 (Julian)

111TCE LT	1.0000	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
112TCE LT	1.0000									
110CE LT	1.0000									
110CLE LT	1.0000									
120CE LT	5.0000									
120CLE LT	1.0000									
120CLP LT	1.0000									
130CLB LT	1.0000									

L.T. - less than value N.A. - Not Analyzed R - Rejected-out of control UNITS OF MEASUREMENT - Site Type (WELL - UCL) and (BORE, MASS, CUMH - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

Table H-1  
COMPLETE LISTING OF TRIP BLANKS

(GMA DATABASE)

Volatiles	Semi-Volatiles	OSCS	OCPS	DOCP	Dimp/DMD	OSCS	IRPA/MPA	IATSONIC	F Mercury	F ICP
WCT5W14 (CONT'D)										
130CP LT 4.0000										
130MS LT 1.0000										
2CLEVE LT 3.5000										
AC27 32.1000										
ACRYLO LT 8.0000										
BRDCLR LT 1.0000										
CHDCL LT 12.0000										
CHDCL LT 8.0000										
CHG LT 1.0000										
COL3F LT 1.0000										
COL4 LT 1.0000										
ODCL2 LT 1.0000										
ODMR LT 14.0000										
ODCL LT 1.2000										
ODMD LT 11.0000										
ODCL3 47.0000										
ODMS LT 1.0000										
ODMCLR LT 1.0000										
ODLB LT 2.0000										
ETOMAS LT 1.0000										
MECOMS LT 1.0000										
MEK LT 16.0000										
MIK LT 1.0000										
TCLEA LT 1.5000										
TCLEE LT 1.0000										
TRCLE LT 1.0000										
XYLEN LT 2.0000										
----- Field number - WCD00044 Site ID - WCD0004 Site type - MASS Sample Date - 8/14/93 (Julian)										
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
----- Field number - WCD0004 Site ID - WCD0004 Site type - MASS Sample Date - 8/14/93 (Julian)										
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
----- Field number - WCD0004 Site ID - WCD0004 Site type - BORE Sample Date - 8/15/93 (Julian)										
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

L.T. = less than (value) N.A. = NOT ANALYZED R = Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, MASS, COMB - UCL)  
 f - indicates filtered sample analysis See Appendix K for explanation of field number





401e H-2  
COMPLETE LISTING OF FIELD BLANKS

(RMA Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DOCP	DIAP/DMAP	OSCHS	IMPA/MPA	IATSENIC	F I MERCURY	F I COP	F I METALS
Field number - WC70005	Site ID - 01077	Site type - WELL	Sample Date - 89153 (Julian)								
L.T.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	AS LT 2.3500	MG LT 0.1000	F N.A.	
								AS LT 2.3500	MG LT 0.1000		
Field number - WC35005	Site ID - 36055	Site type - WELL	Sample Date - 89164 (Julian)								
L.T.	L.T.	BTZ LT 5.0000	ALDWH LT 0.0500	N.A.	DIAP LT 0.3920	TDQCL LT 6.6000	N.A.	AS LT 2.3500	F MG LT 0.1000	F CA LT 500.0000	
		CMG5 LT 5.6900	CL6CP LT 0.0400		DMAP LT 0.1800			AS LT 2.3500	MG LT 0.1000	CD LT 8.4000	
		CMG60 LT 11.5000	CLDWH LT 0.0950							CR LT 24.0000	
		CMG602 LT 7.4600	DLDRH LT 0.0500							CU LT 26.0000	
		DITH LT 1.3400	ENDWH LT 0.0500							K LT 250.0000	
		DMOS LT 0.3500	ISODR LT 0.0510							MG LT 500.0000	
		OXAT LT 2.3600	PPDDE LT 0.0540							MA 3100.0000	
			PPDPT LT 0.0490							PB LT 74.0000	
										ZN LT 22.0000	
Field number - WC39005	Site ID - 36189	Site type - WELL	Sample Date - 89158 (Julian)								
L.T.	L.T.	BTZ LT 5.0000	ALDWH LT 0.0500	DOCP LT 0.1950	DIAP LT 0.3920	TDQCL LT 6.6000	FCZA LT 100.0000	AS LT 2.3500	MG LT 0.1000	CA LT 500.0000	
		CMG5 LT 5.6900	CL6CP LT 0.0400		DMAP LT 0.1800		IMPA LT 100.0000			CD LT 8.4000	
		CMG60 LT 11.5000	CLDWH LT 0.0950				MPA LT 100.0000			CR LT 24.0000	
		CMG602 LT 7.4600	DLDRH LT 0.0500							CU LT 26.0000	
		DITH LT 1.3400	ENDWH LT 0.0500							K LT 250.0000	
		DMOS LT 0.3500	ISODR LT 0.0510							MG LT 500.0000	
		OXAT LT 2.3600	PPDDE LT 0.0540							MA 1950.0000	
			PPDPT LT 0.0490							PB LT 74.0000	
										ZN LT 22.0000	
Field number - WC32005	Site ID - 36192	Site type - WELL	Sample Date - 89164 (Julian)								
L.T.	L.T.	BTZ LT 5.0000	ALDWH LT 0.0500	DOCP LT 0.1950	DIAP LT 0.3920	TDQCL LT 6.6000	FCZA LT 100.0000	AS LT 2.3500	MG LT 0.1000	CA LT 500.0000	
		CMG5 LT 5.6900	CL6CP LT 0.0400		DMAP LT 0.1800		IMPA LT 100.0000			CD LT 8.4000	
		CMG60 LT 11.5000	CLDWH LT 0.0950				MPA LT 100.0000			CR LT 24.0000	
		CMG602 LT 7.4600	DLDRH LT 0.0500							CU LT 26.0000	
		DITH LT 1.3400	ENDWH LT 0.0500							K LT 250.0000	
		DMOS LT 0.3500	ISODR LT 0.0510							MG LT 500.0000	
		OXAT LT 2.3600	PPDDE LT 0.0540							MA LT 940.0000	
			PPDPT LT 0.0490							PB LT 74.0000	

L.T. = less than (value) N.A. = Not Analyzed R = Rejected-out of Control Units of measurement - Site type (WELL - UCL) and (DOSE, MASS, CMPPH - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

## COMPLETE LISTING OF FIELD BLANKS

(RMA Database)

[illegible]

920005 (Cont'd)

26	17	22.0000
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R = Rejected-out of control      Units of measurement - Site type (Well - UCL) and (Bore, Mass, CAPH - UCL)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = Not Analyzed  
F = Indicates filtered sample analysis

R = Rejected-out of control    Units of measurement - Site type (WELL - UCL) and (BORE - WASS, CHPH - UCL)  
See Appendix K for explanation of field number

**Table H-3**  
**COMPLETE LISTING OF RINSATES**

(RNA Database)

[illegible]

L, T, = less than (value)  
 N.A. = Not Analyzed  
 = Indicates filtered sample analysis  
 R = Rejected-out of control  
 Units of measurement - Site type (WELL - UCL) and (DOSE, MASS, CMPI - UCL)  
 See Appendix K for explanation of field number



(b)(5) DPP, (b)(7)(C), (b)(7)(D)

[illegible]

R = REJECTED-OUT OF CONTROL      UNITS OF MEASUREMENT - SLIT TYPE (WELL = UCL) AND (BORE, MASS, CAPH = UCL)  
See Appendix K for explanation of field number

Table H-3  
COMPLETE LISTING OF RIMSATES

(RMA Database)

Volatiles

1 Semi-Volatiles

OSCS

OCPS

DBCP

DIMD/DIMO

OSCS

IMPA/MPA

INAT/INIC

1 INAT/INIC

1 INAT/INIC

1 INAT/INIC

WC75023 (Cont'd)

Field Number	WC75023	Site ID	36075	Site Type	WELL	Sample Date	89166	(Julian)	CA	LT	500.0000
L.T.											
L.T.											
BTZ	LT	5.0000	ALDIN	LT	0.0500	DBCP	LT	0.1950	DIMP	LT	0.1000
CPMS	LT	5.6900	CLDAN	LT	0.0950						
CPMS0	LT	11.5000	CLDAN	LT	0.0500						
CPMS02	LT	7.4600	ENDRN	LT	0.0716						
DITH	LT	1.3400	ISODR	LT	0.0310						
DMS	LT	0.5500	PPDOE	LT	0.0540						
DMS	LT	2.3800	PPDOE	LT	0.0709						
FCZA	LT	6.6900	FCZA	LT	100.0000	AS	LT	2.3500	MC	LT	0.1000
IMPA	LT	100.0000									
IMPA	LT	100.0000									
IMPA	LT	100.0000									
CA	LT	500.0000									
CD	LT	8.4000									
CR	LT	24.0000									
CU	LT	26.0000									
K	LT	250.0000									
MC	LT	500.0000									
NA	LT	940.0000									
PA	LT	74.0000									
Zn	LT	22.0000									

Field Number - WC000003 Site ID - 36080 Site Type - WELL Sample Date - 89121 (Julian)

L.T.											
L.T.											
BTZ	LT	5.0000	ALDIN	LT	0.0500	DBCP	LT	0.1950	DIMP	LT	0.1000
CPMS	LT	5.6900	CLDAN	LT	0.0950						
CPMS0	LT	11.5000	CLDAN	LT	0.0500						
CPMS02	LT	7.4600	ENDRN	LT	0.0500						
DITH	LT	1.3400	ISODR	LT	0.0500						
DMS	LT	0.5500	ISODR	LT	0.0510						
DMS	LT	2.3800	PPDOE	LT	0.0709						
FCZA	LT	6.6900	FCZA	LT	100.0000	AS	LT	2.3500	MC	LT	0.1000
IMPA	LT	100.0000									
IMPA	LT	100.0000									
IMPA	LT	100.0000									
CA	LT	500.0000									
CD	LT	8.4000									
CR	LT	24.0000									
CU	LT	26.0000									
K	LT	250.0000									
MC	LT	500.0000									

L.T. - Less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement - Site type (WELL - UCL) and (Bore, IMPS, CMPI - UCL)

F - Indicates filtered sample analysis See Appendix K for explanation of field number

NO. 5  
05/90

AD10 H-3  
COMPLETE LISTING OF RINSATES

(RNA Database)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIMP/DIMP	OSCHS	IMPA/MPA	AT/SONIC	F	MERCURY	F	ICP
WC30003 (Cont'd)												
OXAT LT 2.3800	PPDOE LT 0.0540											NA LT 948.0000
PPDOY LT 0.0490												PB LT 74.0000
												ZN LT 22.0000
Field number - WC340003	Site ID - 36004	Site type - WELL	Sample Date - 89115 (Julian)									
L.T.												
BTZ LT 5.0000	ALDHN LT 0.3050	DBCP LT 0.1950	N.A.									CA LT 508.0000
CPMS LT 5.6900	CLCP LT 0.0490											CD LT 8.4000
CPMSO LT 11.5000	CLDHN LT 0.0950											CE LT 24.0000
CPMSO2 LT 7.4600	DLDHN LT 0.0860											CU LT 26.0000
DITH LT 1.3400	ENDHN LT 0.1470											K LT 250.0000
DMS LT 0.5500	ISDHR LT 0.0510											MC LT 508.0000
OXAT LT 2.3800	PPDOE LT 0.0540											NA LT 948.0000
PPDOY LT 0.0490												PB LT 74.0000
												ZN LT 22.0000
Field number - WC350003	Site ID - 36005	Site type - WELL	Sample Date - 89121 (Julian)									
L.T.												
BTZ LT 5.0000	ALDHN LT 0.0500	DBCP LT 0.1950	DIMP LT 0.1000									CA LT 308.0000
CPMS LT 5.6900	CLCP LT 0.0490											CD LT 8.4000
CPMSO LT 11.5000	CLDHN LT 0.0950											CE LT 24.0000
CPMSO2 LT 7.4600	DLDHN LT 0.0500											CU LT 26.0000
DITH LT 1.3400	ENDHN LT 0.0500											K LT 250.0000
DMS LT 0.5500	ISDHR LT 0.0510											MC LT 508.0000
OXAT LT 2.3800	PPDOE LT 0.0540											NA LT 948.0000
PPDOY LT 0.0490												PB LT 74.0000
												ZN LT 22.0000
Field number - WC380003	Site ID - 36008	Site type - WELL	Sample Date - 89118 (Julian)									
L.T.												
BTZ LT 5.0000	ALDHN LT 0.0500	DBCP LT 0.1950	DIMP LT 0.1000									CA LT 500.0000
CPMS LT 5.6900	CLCP LT 0.0490											CD LT 8.4000
CPMSO LT 11.5000	CLDHN LT 0.0950											CE LT 24.0000
CPMSO2 LT 7.4600	DLDHN LT 0.0500											CU LT 26.0000
DITH LT 1.3400	ENDHN LT 0.0500											K LT 250.0000
DMS LT 0.5500	ISDHR LT 0.0510											MC LT 508.0000
OXAT LT 2.3800	PPDOE LT 0.0540											NA LT 948.0000
PPDOY LT 0.0490												PB LT 74.0000
												ZN LT 22.0000

L.T. - less than (value) N.A. - NOT Analyzed R - Rejected - not of control Units of measurement - Site type (WELL - UCL) and (BORE, MASS, CUPH - UCC)  
F - indicates filtered sample analysis See Appendix K for explanation of field number



## COMPLETE LISTING OF RINSATES

(RNA Database)

WC38D003 (CONT'D)												
Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIBP/DIBP	OSCHS	IMPA/MPA	Arsenic	Mercury	ICP		
130MS LT 1.0000												
20LEWE LT 3.5000												
ACET 101.0000												
ACRYLO LT 8.4000												
BROCLM LT 1.0000												
CHOCCL LT 12.0000												
CHSCCL LT 8.0000												
CHMS LT 1.0000												
CHL3F LT 1.0000												
CHL4 LT 1.0000												
CHCL2 LT 1.0000												
CHMS LT 14.0000												
CHCL LT 1.2000												
CHMS LT 11.0000												
CHCL3 LT 1.0000												
CHMS LT 1.0000												
CHCLM LT 1.0000												
CHCL LT 2.0000												
ETCHMS LT 1.0000												
MECHMS LT 1.0000												
MEK LT 10.0000												
MIBK LT 1.4000												
TCLEA LT 1.5000												
TCLEE LT 1.0000												
THCLE LT 3.9000												
XYLEN LT 2.0000												

Field number - WC38D003 Site ID - 36188 Site type - WELL Sample Date - 8/1/58 (Julian)														
L.T.	L.T.	812	LT	5.0000	ALDIN	LT	0.0500	DBCP	LT	0.1950	DIBP	LT	0.3920	N.A.
		CPMS	LT <td>5.6000</td> <td>CLCP</td> <td>LT <td>0.0480</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	5.6000	CLCP	LT <td>0.0480</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0480							
		CPMS	LT <td>11.5000</td> <td>CLDAN</td> <td>LT <td>0.0950</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	11.5000	CLDAN	LT <td>0.0950</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0950							
		CPMS	LT <td>7.4000</td> <td>CLDIN</td> <td>LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	7.4000	CLDIN	LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0500							
		DITH	LT <td>1.3000</td> <td>ENDIN</td> <td>LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	1.3000	ENDIN	LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0500							
		DMS	LT <td>0.5500</td> <td>ISDOR</td> <td>LT <td>0.0510</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	0.5500	ISDOR	LT <td>0.0510</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0510							
		ONAT	LT <td>2.3000</td> <td>PPDCE</td> <td>LT <td>0.0540</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	2.3000	PPDCE	LT <td>0.0540</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0540							
					PPDCT	LT <td>0.0490</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0490							

Field number - WC38D003 Site ID - 36188 Site type - WELL Sample Date - 8/1/58 (Julian)														
L.T.	L.T.	812	LT	5.0000	ALDIN	LT	0.0500	DBCP	LT	0.1950	DIBP	LT	0.3920	N.A.
		CPMS	LT <td>5.6000</td> <td>CLCP</td> <td>LT <td>0.0480</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	5.6000	CLCP	LT <td>0.0480</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0480							
		CPMS	LT <td>11.5000</td> <td>CLDAN</td> <td>LT <td>0.0950</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	11.5000	CLDAN	LT <td>0.0950</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0950							
		CPMS	LT <td>7.4000</td> <td>CLDIN</td> <td>LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	7.4000	CLDIN	LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0500							
		DITH	LT <td>1.3000</td> <td>ENDIN</td> <td>LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	1.3000	ENDIN	LT <td>0.0500</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0500							
		DMS	LT <td>0.5500</td> <td>ISDOR</td> <td>LT <td>0.0510</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </td>	0.5500	ISDOR	LT <td>0.0510</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.0510							
		ONAT	LT <td>2.3000</td> <td>PPDCE</td> <td>LT </td>	2.3000	PPDCE	LT								

Field number - W035003	Site ID - 36109	Site type - BORE	Sample Date - 09110 (Julian)
<p>-----</p>			

111TCE	L.T.	0.0000	L.T.
BIZ	L.T.	5.0000	ALDEN L.T.
		0.0500	D8CP L.T.
		0.9820	TDCCL L.T.
		17.7000	N.A.
		AS	L.T.
		2.3500	MC
		0.1520	CA
		LT	500.0000

R = Rejected-out of control      Units of measurement - Site type (WELL = UCL) and (BORE, MASS, CDPH = LUG)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = not available  
f = indicators filtered sample analysis

## COMPLETE LISTING OF RINSATES

(RNA Database)

[illegible]

```
----- Field number - W0000013  Site ID - 36109
                                     Date - 2010
                                     Type - BORE
                                     Sample Date - 09/10
                                     Unit(m) -
```

R = rejected-out of control      Units of measurement - Site type (WELL - UCL) and (MORE - MASS - CMH - UCL)  
See Appendix K for explanation of field number

L.Y. = less than (value)      N.A. =  
F = indicates filtered sample analysis

WFO 4-3  
COMPLETE LISTING OF RINSATES

### COMPLETE LISTING OF RINSATES

(RNA Database)

Field number - WCR0003		Site ID - 36190	Site type - WELL	Sample date - 8/15/86	(Julien)	
L.T.		B12 LT 5.0000 N.A.	DSCP LT 0.1950 DIMP LT 0.3920 N.A.			
L.T.		CPMS LT 5.6900	DAMP LT 0.1860			
L.T.		CPMS LT 11.5000				
110CE LT 1.0000	CPMS LT 11.5000 CLDM LT 0.0950					
110CLE LT 1.0000	CPMS02 LT 7.4600 DLOM LT 0.0500					
120CE LT 5.0000	DITH LT 1.1400 DORN LT 0.0500					
120CLE LT 1.0000	DMS LT 5.5700 DORR LT 0.0510					
120CLP LT 1.0000	DVAT LT 2.3400 PPODE LT 0.0540					
130CLB LT 1.0000	PPODT LT 0.0490					
130CP LT 4.8000						
130MB LT 1.0000						
2CLEVE LT 3.5000						
ACEY LT 8.0000						
ACRYLO LT 8.4000						
BROCLM LT 1.0000						
CHNOQ LT 12.0000						
CHNOQ LT 8.0000						
CHMS LT 1.0000						
CLL3F LT 1.0000						
CLL4 LT 1.0000						
CHCL2 LT 1.0000						
CHMR LT 14.0000						
CHCL LT 1.2000						
CHCL3 LT 11.0000						
CHCL3 9.4000						
CHMS LT 1.0000						
CHCLM LT 1.0000						
CHCL LT 2.0000						
ETOMMS LT 1.0000						
MECHMS LT 1.0000						
MEK LT 10.0000						
MIHK LT 1.4000						
TCLEA LT 1.5000						
TCLEE LT 1.0000						
TRCLE LT 1.0000						
XYLON LT 2.0000						

WCR0003 (Cont'd)										
Volatiles	Semi-volatiles	OSCS	OCPS	DSCP	DIMP/DAMP	OSCLs	IMPA/MPA	IATsonic	Mercury	F I ICP
	</									

R = Rejected-out of control    Units of measurement - Site type (WELL - UCL) and (BORE, MASS, CMFH - UCL)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = Not Analyzed  
F = Indicates filtered sample analysis

AD10 H-3  
COMPLETE LISTING OF RINSATES

(RNA Database)

[illegible]

Site	Type	Well	Sample Date	09166	( Julian )
1734	0041	0115			

Field Number - W0900013 Site ID - 36190

**M.A.**

**M.A.**

FC2A LT 100,0000 N.A.

**N.A.**

## N-A

## H.A.

**W**

11

Site type - WELL Sample Date - 89166 (Julian)

Field Number - WCV00023 Site ID - 36190

L. T.	254TGP	LT	1.7000	87Z	LT	5.0000	ALDWH	LT	0.0500	DBCP	LT	0.1950	DIMP	LT	0.3970	TDDCL	LT	5.5900	FC2A	LT	100.0000	AS	LT	2.3500	HC	LT	0.1000	CA	LT	500.0000
	245TGP	LT	2.8000	CPH5	LT	5.5900	CLDWH	LT	0.0950																		CD	LT	8.0000	
	246TGP	LT	93.6000	CPH50	LT	11.5000	DLDWH	LT	0.0500																		CS	LT	24.0000	
	247TGP	LT	8.4000	CPH502	LT	7.4600	ENDWH	LT	0.0500																		CJ	LT	26.0000	
	248TGP	LT	4.4000	DI TH	LT	1.3400	ISDWH	LT	0.0510																		R	LT	250.0000	
	249TGP	LT	176.0000	DW05	LT	0.5500	PPD0E	LT	0.0540																		MC	LT	500.0000	
	2CLP	LT	2.0000	ONAT	LT	2.3600	PPD0T	LT	0.0490																		NA	LT	940.0000	
	2BP	LT	3.6000																								PH	LT	74.0000	
		LT	0.0000																								ZH	LT	22.0000	

**R** - Rejected-out of control      **Units of measurement** - Site type (WELL - UCL) and (MORE, MASS, CMW - UCL)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = Not Analyzed  
F = indicates filtered sample analysis



### COMPLETE LISTING OF RINSATES

(RMA 00100430)

WC300053 (Cont'd)																	
Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	Dibp/Dmp	OSCHS	HPMA/HPA	IA/Senic	Pb	Mercury	F	ICP					
											</						

Field number - W525193    Site ID - 36192    Site Name - SITE    Sample Date - 09/37 (Julian)

L.Y. L.Y. 012 LY \$,0000 M.A.

**I.T. : (033 17000 (vii/1997)**  
**N.A. : 1601 A001/0280**

R - Rejected-out of Control      Units of measurement - Site type (WELL - UCL) and (MORE, MASS, CMFH - LOC)  
See Appendix K for explanation of field number

R = rejected-out of control      Units of measurement - Site type (Well = U2) and (Dore, Mass. CPHH = U02)  
See appendix K for explanation of field number





## (RNA Database)

[illegible]

R - Rejected-out of control      Units of measurement - Site type (WELL - UCL) and (BONE - MASS, CMFH - UCL)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = Not Analyzed  
F = indicates filtered sample analysis

## (RNA Database)

[illegible]

Field number - WCD-0003	Site ID - 36TRENCH04	Site type - WASS	Sample Date - 09116 (Julian)
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50
51	51	51	51
52	52	52	52
53	53	53	53
54	54	54	54
55	55	55	55
56	56	56	56
57	57	57	57
58	58	58	58
59	59	59	59
60	60	60	60
61	61	61	61
62	62	62	62
63	63	63	63
64	64	64	64
65	65	65	65
66	66	66	66
67	67	67	67
68	68	68	68
69	69	69	69
70	70	70	70
71	71	71	71
72	72	72	72
73	73	73	73
74	74	74	74
75	75	75	75
76	76	76	76
77	77	77	77
78	78	78	78
79	79	79	79
80	80	80	80
81	81	81	81
82	82	82	82
83	83	83	83
84	84	84	84
85	85	85	85
86	86	86	86
87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

[illegible]

R = Rejected-out of control      Units of measurement - Site type (Well = U2) and (Bore, Wast, CAPH = UGC)  
See Appendix K for explanation of Field number

## COMPLETE LISTING OF RINSATES

(as required under)

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	Oil/Oil/Dump	OSCONS	IMP/MPA	IArsenic	F Mercury	F ICP	
WCD#003 (CONT'D)											
		DMS LT	0.5500	ISODR LT	0.0510					MC LT	900.0000
		OMAT LT	2.3000	PPRODE LT	0.0540					MA LT	940.0000
				PPRODT	0.3430					PB LT	74.0000
										ZN LT	22.0000
----- Field number - WCD#003 Site ID - 36TRENCH05 Site type - WASS Sample Date - 09124 (Julian)											
N.A.	L.T.										
		BTZ LT	5.0000	ALDRN LT	0.0500	DBCP LT	0.1950	DIMP LT	0.1950	DIMP LT	0.1950
		CPMS LT	5.6900	CL6CP LT	0.0480						
		CPMS0 LT	11.5000	CLDAM LT	0.0950						
		CPMS02 LT	7.4600	DLDRN LT	0.0500						
		DITH LT	1.3400	ENDRN LT	0.0500						
		DMS LT	0.5500	ISODR LT	0.0510						
		OMAT LT	2.3000	PPRODE LT	0.0540						
				PPRODT LT	0.0490						
----- Field number - WCD#003 Site ID - 36TRENCH05 Site type - WASS Sample Date - 09124 (Julian)											
N.A.	L.T.										
		BTZ LT	5.0000	ALDRN LT	0.0500	DBCP LT	0.1950	DIMP LT	0.1950	DIMP LT	0.1950
		CPMS LT	5.6900	CL6CP LT	0.0480						
		CPMS0 LT	11.5000	CLDAM LT	0.0950						
		CPMS02 LT	7.4600	DLDRN LT	0.0500						
		DITH LT	1.3400	ENDRN LT	0.0500						
		DMS LT	0.5500	ISODR LT	0.0510						
		OMAT LT	2.3000	PPRODE LT	0.0540						
				PPRODT LT	0.0490						
----- Field number - WCD#003 Site ID - 36TRENCH09 Site type - WASS Sample Date - 09117 (Julian)											
L.T.	L.T.										
		BTZ LT	5.0000	ALDRN LT	0.0500	DBCP LT	0.1950	DIMP LT	0.1950	DIMP LT	0.1950
		CPMS LT	5.6900	CL6CP LT	0.0480						
		CPMS0 LT	11.5000	CLDAM LT	0.0950						
		CPMS02 LT	7.4600	DLDRN LT	0.0500						
		DITH LT	1.3400	ENDRN LT	0.0500						
		DMS LT	0.5500	ISODR LT	0.0510						
		OMAT LT	2.3000	PPRODE LT	0.0540						
				PPRODT LT	0.0490						
----- Field number - WCD#003 Site ID - 36TRENCH09 Site type - WASS Sample Date - 09117 (Julian)											
L.T.	L.T.										
		BTZ LT	5.0000	ALDRN LT	0.0500	DBCP LT	0.1950	DIMP LT	0.1950	DIMP LT	0.1950
		CPMS LT	5.6900	CL6CP LT	0.0480						
		CPMS0 LT	11.5000	CLDAM LT	0.0950						
		CPMS02 LT	7.4600	DLDRN LT	0.0500						
		DITH LT	1.3400	ENDRN LT	0.0500						
		DMS LT	0.5500	ISODR LT	0.0510						
		OMAT LT	2.3000	PPRODE LT	0.0540						
				PPRODT LT	0.0490						

R = Rejected-out of control units of measurement - site type (WELL - UCL) and (BONE, MASS, CUPH - UCC)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = Not Analyzed  
 \* - indicates filtered sample analysis

[illegible]

Field number - WCI 20003	Site ID - 36TRENCH4	Site (VOR - WASS	Sample Date - 89121	(Julian)
.....				

1111CE	LT	1.0000	L.T.	BTZ	LT	5.0000	ALDRN	LT	0.0500	DRCP	LT	0.1950	DIMP	LT	0.6190	TDCCL	LT	6.6500	FCZA	LT	100.0000	AS	LT	2.3500	HC	LT	0.1000	CA	LT	500.0000
1121CE	LT	1.0000		CPMS	LT	5.6000	CLSCP	LT	0.0400																	CD	LT	8.4000		
1131CE	LT	1.0000		CPMS0	LT	11.5000	CLDAM	LT	0.0950																	CR	LT	24.0000		
1141CE	LT	1.0000		CPMS02	LT	7.4600	DLDRN	LT	0.0500																	CJ	LT	26.8000		
1151CE	LT	1.0000		DHDS	LT	1.3400	ENDRN		0.0643																	K	LT	250.0000		
1202CE	LT	5.0000		DWDS	LT	0.5500	15DGR	LT	0.0510																	MC	LT	500.0000		
1203CE	LT	1.0000		DWAT	LT	2.3000	PPDCE		0.0794																	NA	LT	940.0000		
1204CE	LT	1.0000					PPDCE	LT	0.0490																		PB	LT	74.0000	
1205CE	LT	1.0000					PPDCE																			2N	LT	22.0000		

L.T. = less than (value)  
N.A. = Not Analyzed  
R = rejected-out of control  
Units of measurement - Site type (WELL = UCL) and (BORE, MASS, OPEN = UCL)  
See Appendix K for explanation of field number

L.T. = less than (value)      N.A. = Not Analyzed  
F = Indicates Filtered Sample analysis

## COMPLETE LISTING OF RINSAYES

(as per 100 mg)

----- field number - WC17W003 Site ID = 36TRENCH17 Site type = WASS Sample Date = 89129 (Julian)																				
volatiles	Semi-volatiles	OSCs	OCPs	DBCP	DIBD/DIMP	OSCHS	IHPA/HPA	Arsenic	Hg	As	LT	HC	CA	LT	500.0000					
													CD	LT	8.40000					
													CR	LT	24.0000					
													CJ	LT	26.0000					
													K	LT	250.0000					
													MC	LT	500.0000					
													MA	LT	940.0000					
													PB	LT	74.0000					
													ZN	LT	22.0000					
111TCE LT	1.0000	L.T.	BIZ LT	5.0000	ALDRIN LT	0.0500	DBCP LT	0.1950	DIMP LT	0.3920	TDOCL LT	0.1890	AS	LT	2.3500	HC	0.1470	CA	LT	500.0000
112TCE LT	1.0000		CPHS LT	5.6900	CLDAN LT	0.0950												CD	LT	8.40000
11DCE LT	1.0000		CPMSO LT	11.5000	DLDRN LT	0.0500												CR	LT	24.0000
11DCLE LT	1.0000		CPMSO2 LT	7.4600	ENDRN LT	0.0500												CJ	LT	26.0000
120TCE LT	5.0000		DITH LT	1.3400	ISODR LT	0.0510												K	LT	250.0000
120CLE LT	1.0000		DADS LT	0.5500	PPODE LT	0.0540												MC	LT	500.0000
120CLP LT	1.0000		DMAT LT	2.3600	PRODT LT	0.0490												MA	LT	940.0000
130CLB LT	1.0000																	PB	LT	74.0000
130CZ LT	4.0000																	ZN	LT	22.0000

```
----- field number - wcswn03      site id - M-115WASS      site type - WASS      sample date - 89128 (julian)
```

[illegible]

L, T, = less than (value)  
N, A, = not analyzed  
R = rejected-out of control  
See Appendix K for explanation of field number

**! T : loss: then (value)**

F - Indicates filtered sample analysis

F - indicates filtered sample analysis

f - indicators filtered sample analysis

**f** - indicators filtered sample analysis

**f** - indicates filtered sample analysis

F - Indicates filtered sample analysis

f - indicates filtered sample analysis

0 H-3  
COMPLETE LISTING OF RIMSATES

(RMA DR18056)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIBO/DIBD	OSCS	IMPA/MPA	ATS/STIC	F	IMP/CTV	F	ICP
112ICE LT	1.0000 120CLB LT	1.7000 CPMS LT	5.5000 CLDM LT	0.0950								CP LT 5.4000
11DCE LT	1.0000 120PH MD	2.0000 CPMSO LT	11.5000 DLDN LT	0.0500								CR LT 24.0000
11DCE LT	1.0000 130CLB LT	1.7000 CPMSO2 LT	7.4600 ENDM LT	0.0500								CJ LT 26.0000
12DCE LT	5.0000 140CLB LT	1.7000 DITH LT	1.3400 ISDR LT	0.0510								K LT 561.0000
12DCE LT	1.0000 235TCP LT	1.7000 DMS LT	0.5500 PPODE LT	0.0540								MC LT 500.0000
12DCLP LT	1.0000 245TCP LT	5.3000 GRAT LT	2.3000 PPODT LT	0.0490								MA LT 940.0000
130CLB LT	1.0000 245TCP LT	2.8000										PH LT 74.0000
130CP LT	4.8000 245TCP LT	4.2000										2H LT 22.0000
130MB LT	1.0000 245TCP LT	3.6000										
2CLEVE LT	3.5000 240CLP LT	2.9000										
ACET	44.4000 240CLP LT	8.4000										
ACTYLO LT	8.4000 240PH LT	5.8000										
BROCLM LT	1.0000 240PH LT	4.4000										
CHOCCL LT	12.0000 240PH LT	21.0000										
CHOCCL LT	8.0000 240PH LT	176.0000										
CHMS LT	1.0000 240NT LT	4.5000										
CCL3F LT	1.0000 240NT LT	0.7900										
CCL4 LT	1.0000 20E10	1.0000										
CHCL2 LT	1.0000 2CLP LT	0.9900										
CHCL LT	14.0000 2CLP LT	2.8000										
CHCL LT	1.2000 20MAP LT	0.9000										
CHCL3 LT	1.0000 2MP LT	3.9000										
CHCL4 LT	1.0000 2MP LT	3.6000										
CHCLM LT	1.0000 24MH LT	4.3000										
DHCLB LT	2.0000 2MP LT	3.7000										
ETOSMS LT	1.0000 2MP LT	8.2000										
MECHMS LT	1.0000 33000 MD	12.0000										
MEK LT	10.0000 24MH LT	4.9000										
MIBK LT	1.4000 4602C MD	17.0000										
TCLEA LT	1.5000 480PPE MD	4.2000										
TCLEE LT	1.0000 40MH LT	7.3000										
TRCLE LT	1.0000 4CL3C LT	4.0000										
XYLEN LT	2.0000 4CL3C LT	8.5000										
	4CLPPE LT	5.1000										
	4MP LT	0.5200										
	4MP LT	2.8000										
	4MH LT	5.2000										
	4MP LT	12.0000										

L.T. = less than (value) M.A. = NOT Analyzed R = Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BURE. MASS. CMFH - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

NO. 20  
J5/90

J10 M-3  
COMPLETE LISTING OF RINSATES

(RMA DATABASE)

Volatiles	Semi-Volatiles	OSCs	OCPS	DBCP	DIBD/DIBD	OSCHS	INPA/MPA	IATSONIC	F I MERCURY	F I ICP
WCSW003 (CONT'D)										
AMP LT 96.0000										
ASHC MD 4.0000										
ACOLOR MD 5.1000										
ALNSLF MD 9.2000										
ALDIN MD 4.7000										
ALDIN LT 13.0000										
ANAPNE LT 1.7000										
ANAPYL LT 0.5000										
ANTRC MD 0.5000										
ATZ LT 5.9000										
BXCEMA LT 1.5000										
BXCIPE LT 3.3000										
BXCLLE LT 1.9000										
BZHP MD 4.8000										
BANTR MD 1.5000										
BAPYR MD 4.7000										
BK/ANT MD 5.4000										
BHC MD 4.0000										
BZP MD 3.4000										
BENSLF MD 9.2000										
BENZIO MD 10.0000										
BENZON LT 13.0000										
BOSHPY MD 6.1000										
BK/ANT MD 0.8700										
BZALC LT 0.7200										
CHRY MD 2.4000										
CL68Z MD 1.6000										
CL6CP LT 8.6000										
CL6CP LT 54.0000										
CL6ET LT 1.5000										
CLDAN LT 37.0000										
CPHS LT 10.0000										
CPHSO LT 15.0000										
CPHSO2 LT 5.3000										
DBAMA MD 6.3000										
DBCP LT 12.0000										
DBHC MD 4.0000										
DBZTUR LT 1.7000										
DCPD LT 5.5000										

L.T. - less than (value) N.A. - NOT ANALYZED R - Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, MASS, CPMH - UCL)  
F - Indicates filtered sample analysis See Appendix X for explanation of field number

104-3  
COMPLETE LISTING OF RINSATES

[illegible]



AD/0 H-3  
COMPLETE LISTING OF RIMSATES

(DMA Database)

Volatiles	Semi-Volatiles	OCES	OCPS	DBCP	DIBD/DIBP	OCES	IMPA/MPA	IAISONIC	F I MERCURY	F I ICP

WCSV003 (CONT'D)

PCB160 MD 36.0000  
PCP MD 18.0000  
PCP LT 9.1000  
PNAWTR MD 0.5000  
PHEMOL LT 9.2000  
PHEMOL LT 2.2000  
PPOD MD 4.0000  
PPOD MD 4.7000  
PPOD LT 14.0000  
PPOD LT 9.2000  
PPOD LT 18.0000  
PETHM LT 37.0000  
PYR MD 2.8000  
SUPOHA LT 19.0000  
TAPREN MD 36.0000

----- field number - WCSV003 Site ID - H-151WASS Site type - WASS Sample Date - 09120 (Julian)

L.T.	124TCB LT	1.8000 BTZ	LT	5.0000 ALDIN	LT	0.0500 N.A.	DIMP LT	0.3920 TDCL	LT	6.6900 N.A.	AS	5.3600	MG	2.7000	CA	2390.0000
	130CLB LT	1.7000 CPM5	LT	5.6000 CLDM	LT	0.0950	DIMP LT	0.1080							CD	8.4800
	130PM MD	2.0000 CPM50	LT	11.5000 DLDM		0.0820									CR	24.0000
	130CLB LT	1.7000 CPM502	LT	7.4600 ENDM	LT	0.0500									CJ	26.0000
	140CLB LT	1.7000 DITH	LT	1.3400 ISODR	LT	0.0310									K	1840.0000
	236TCP LT	1.7000 DMS	LT	0.5500 PPODE	LT	0.0540									MG	500.0000
	245TCP LT	5.2000 GRAT	LT	2.3000 PPODT	LT	0.0490									MA	1640.0000
	245TCP LT	2.8000													PH	74.0000
	246TCP LT	4.2000													ZN	23.5000
	246TCP LT	3.6000														
	240CLP LT	2.9000														
	240CLP LT	8.4000														
	240MPH LT	4.4000														
	240MP LT	21.0000														
	240MP LT	176.0000														
	240MT LT	4.5000														
	240MT LT	0.7900														
	2CLP LT	0.9900														
	2CLP LT	2.8000														
	204P LT	0.5000														

L.T. = less than (value) N.A. = Not Analyzed R = Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, WASS, CPM - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

23  
12/90

10 H-3  
COMPLETE LISTING OF RIMSATES

(BMA Database)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIPO/DMPO	OSCHS	MPA/MPA	Arsenic	F I MERCURY	F I COP
WCSWD013 (Cont'd)										
2MHP LT	1.7000									
2MP LT	3.9000									
2MP LT	3.6000									
2MNHIL LT	4.3000									
2MP LT	3.7000									
2MP LT	8.2000									
33OCED NO	12.0000									
3MNHIL LT	4.9000									
46M2C NO	17.0000									
48MPE NO	4.2000									
4CMHIL LT	7.3000									
4CL3C LT	4.0000									
4CL3C LT	8.5000									
4CLPPE LT	5.1000									
4MP LT	0.5200									
4MP LT	2.8000									
4MNHIL LT	5.2000									
4MP LT	12.0000									
4MP LT	9.0000									
4BHC NO	4.0000									
4CHLOR NO	5.1000									
4BSELF NO	9.2000									
ALDRIN NO	4.7000									
ALDRIN LT	13.0000									
ANAPNE LT	1.7000									
ANAPYL LT	0.5000									
ANTHC NO	0.5000									
ATZ LT	5.9000									
BDC2M LT	1.5000									
BDC1PE LT	5.3000									
BDCLEE LT	1.9000									
BZEPH NO	4.8000									
BAANTH NO	1.6000									
BAPYR NO	4.7000									
BISFAMT NO	5.4000									
BHC NO	4.0000									
BZEPH NO	3.4000									
BENSELF NO	9.2000									
BENZID NO	10.0000									

L.T. - Less than (value)

N.A. - Not Analyzed

R - Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, MASS, CPM - UGC)

See Appendix K for explanation of field number

F - Indicates filtered sample analysis

**Table H-3**  
**COMPLETE LISTING OF RINSATES**

[illegible]

L.T. = less than (value)  
N.A. = Not Analyzed  
R = rejected-out of control  
See Appendix K for explanation of field number

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TABLE H-3  
COMPLETE LISTING OF RINSEATES

(RMA DATABASE)

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIBP/DIBP	OSCHS	IMPA/MPA	IAF/SeNC	F I MERCURY	F I COP	F I METALS	
1241CB LT	1.8000 BTZ	LT	5.0000 ALDM	LT	0.0500 N.A.	DIMP	LT	0.3920 TDCCL	LT	6.6000 N.A.	AS	4.7600 HC
120CLB LT	1.7000 CPMS	LT	5.6000 CLDM	LT	0.0950	DIMP	LT	0.1840				
120PH NO	2.0000 CPMS	LT	11.5000 DDM	LT	0.0500							
L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement - Site type (WELL - UZL) and (BORE, WASS, CMFH - UGC)												
F - Indicates filtered sample analysis See Appendix R for explanation of field number												

----- field number - WCV0023 Site ID - H-115VMS3 Site type - WASS Sample Date - 8/1/28 (Julian)

1241CB LT	1.8000 BTZ	LT	5.0000 ALDM	LT	0.0500 N.A.	DIMP	LT	0.3920 TDCCL	LT	6.6000 N.A.	AS	4.7600 HC	LT	0.1000	CA	LT	500.0000
120CLB LT	1.7000 CPMS	LT	5.6000 CLDM	LT	0.0950	DIMP	LT	0.1840							CD	LT	6.0000
120PH NO	2.0000 CPMS	LT	11.5000 DDM	LT	0.0500										CK	LT	24.0000

L.T. - less than (value)

N.A. - Not Analyzed

R - Rejected-out of control Units of measurement - Site type (WELL - UZL) and (BORE, WASS, CMFH - UGC)

F - Indicates filtered sample analysis

See Appendix R for explanation of field number

Table M-3  
COMPLETE LISTING OF RINSATES

(RMA Database)

Volatiles	Semi-Volatiles	OSCS	DCPS	DBCP	DIBD/DIBD	IASPHIC	IMP/MPA	F I MERCURY	F I COP	
WCSVR023 (Cont'd)										
130CLB LT	1.7000	CHS02 LT	7.4600	ENDSH LT	0.0500					CU LT 26.0000
140CLB LT	1.7000	DITH LT	1.3400	ISDRE LT	0.0510					K LT 250.0000
234TCP LT	1.7000	DMS LT	0.5500	PRIDE LT	0.0540					MG LT 500.0000
245TCP LT	5.2000	OSAT LT	2.3800							MA LT 940.0000
245TCP LT	2.8000									PB LT 74.0000
245TCP LT	4.2000									ZN LT 22.0000
245TCP LT	2.9000									
240CLP LT	8.4000									
240MPL LT	5.8000									
240MPL LT	4.4000									
240MPL LT	21.0000									
240MPL LT	176.0000									
240MPL LT	4.5000									
240MPL LT	0.7900									
2CLP LT	0.9900									
2CLP LT	2.8000									
20ALP LT	0.5000									
20ALP LT	1.7000									
2MP LT	3.9000									
2MP LT	3.6000									
20MIL LT	4.3000									
2MP LT	3.7000									
2MP LT	6.2000									
330CSD MD	12.0000									
30MIL LT	4.9000									
40M2C MD	17.0000									
40M2C MD	4.2000									
40MIL LT	7.3000									
4CL3C LT	4.0000									
4CL3C LT	8.5000									
4CLPPE LT	5.1000									
4MP LT	0.5200									
4MP LT	2.8000									
40MIL LT	5.2000									
4MP LT	12.0000									
4MP LT	96.0000									
4MPC MD	4.0000									
408.08 MD	5.1000									

L.T. = less than (value) N.A. = Not Analyzed R = Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, WASS, CMH - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

Table H-3  
COMPLETE LISTING OF RIMSATES

(RMA Database)										
Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DMD/DMD	OSCS	IMPA/MPA	IATSENIC	F Mercury	F IOP
WCSW023 (CONT'D)										
	AENSLF MD	9.2000								
	ALDIN MD	4.7000								
	ALDIN LT	13.0000								
	ANAPHE LT	1.7000								
	ANAPYL LT	0.5000								
	ANTRC MD	0.5000								
	ATZ LT	5.9000								
	BECEM LT	1.5000								
	BECLPE LT	5.3000								
	BECLPE LT	1.9000								
	BECLPE MD	4.8000								
	BECLPE MD	1.6000								
	BECLPE MD	4.7000								
	BECLPE MD	5.4000								
	BECLPE MD	4.0000								
	BECLPE MD	3.4000								
	BECLPE MD	9.2000								
	BENZID MD	10.0000								
	BENZID LT	13.0000								
	BONIPP MD	6.1000								
	BKANT MD	0.8700								
	BZALC LT	0.7200								
	CRY MD	2.4000								
	CLBZ MD	1.6000								
	CLCOP LT	8.6000								
	CLCOP LT	34.0000								
	CLLET LT	1.5000								
	CLDAN LT	37.0000								
	CPMS LT	10.0000								
	CPMSO LT	15.0000								
	CPMSOZ LT	5.3000								
	DBAMA MD	6.5000								
	DBCP LT	12.0000								
	DBHC MD	4.0000								
	DBZFLR LT	1.7000								
	DCPD LT	5.5000								
	DDVP LT	8.5000								
	DEP LT	2.0000								
	DIMP LT	21.0000								

L.T. - less than (value) N.A. - Not Analyzed R - Rejected-out of control Units of measurement - Site type (WELL - UCL) and (BORE, MASS, CDM - UCL)  
F - Indicates filtered sample analysis See Appendix K for explanation of field number

**Table H-3**  
**COMPLETE LISTING OF RIMSATES**

(RMA Database)										
Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIBD/DIBP	OSCS	IMPA/MPA	IA/SePIC	F I METALITY	F I ICP
WCSW023 (Cont'd)										
DITH	LT	3.3000								
DLOBN	MD	4.7000								
DLOBN	LT	26.0000								
DMP	LT	130.0000								
DMP	LT	1.5000								
DMP	MD	3.7000								
DMP	MD	15.0000								
ENDRN	MD	7.6000								
ENDRN	LT	18.0000								
ENDRNA	MD	8.0000								
ENDRNA	MD	8.0000								
ESFS04	MD	9.2000								
PANT	MD	3.3000								
FLRENE	LT	3.7000								
ODLOR	MD	5.1000								
PCBO	LT	3.4000								
MPCL	MD	2.0000								
MPCL	MD	5.0000								
ICDPVR	MD	8.6000								
ISODR	LT	7.8000								
ISOPHR	LT	4.8000								
LIN	MD	4.0000								
MEKCLR	MD	5.1000								
ALTH	LT	21.0000								
NAP	LT	0.5000								
NB	LT	0.5000								
NDMEA	MD	2.0000								
NDMPA	LT	4.4000								
NDMPA	MD	3.0000								
OWAT	LT	27.0000								
PCB016	MD	21.0000								
PCB221	MD	21.0000								
PCB232	MD	21.0000								
PCB242	MD	30.0000								
PCB248	MD	30.0000								
PCB254	MD	36.0000								
PCB260	MD	36.0000								
PCP	MD	18.0000								
PCP	LT	9.1000								

L.T. = less than (value)      N.A. = Not Analyzed  
 R = Rejected-out of control      Units of measurement - site type (WELL - UZ) and (BORE, MASS, CAPH - UCC)  
 f - Indicates filtered sample analysis      See Appendix K for explanation of field number

R = Rejected-out of control    Units of measurement - Site type (WELL - UCL) and (BONE, MASS, CMFH - UCL)  
See Appendix K for explanation of field number

L.T. = less than (value)    N.A. = Not Analyzed  
F = Indicates filtered sample analysis



**Table H-4**  
**Complete Listing**  
**of**  
**Sample and Duplicate**

[illegible]

L.T. - Less than certified reporting limits      N.A. - Analysis not requested      F - Indicates filtered sample analysis

[illegible]

1. 7. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

Table H-4  
Complete listing  
of  
sample and duplicate

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIMP/DIMP	OSCHS	IMPA/MPA	Arsenic	F I MERCURY	F I COP	F I Metals

DUPLICATE - WCS40002 CONTINUED

DCLB LT10000.0000 ENDEN LT 18.0000  
ETCHS LT 5000.0000 ISOR LT 7.8000  
MECHS LT 5000.0000 MTH LT 21.0000  
MEK LT50000.0000 OAT LT 27.0000  
MIBK LT 7000.0000 PCP LT 9.1000  
TCLEA LT 7500.0000 PHENOL 69.8000  
TCLEE LT 5000.0000 PPODE LT 14.0000  
TRCLE LT 5000.0000 PPOOT LT 18.0000  
XYLEN LT10000.0000 PRTH LT 37.0000  
SUPONA LT 19.0000

Field number - WCS7001 Site ID - 30667 Site type - WELL Sample Date - 89117 (Julian)

111TCE LT 100.0000 24TCP 46.7000 BTZ 230.0000 ALDHN 0.7750 DBCP 2200.0000 DIMP LT 0.3920 TDCL LT 67.0000 N.A.	CA	1.8300	HC	17.9000	AS						
112TCE LT 100.0000 245TCP LT 2.8000 CPMS LT 5.6900 CLSCP 1.9000	CD	LT 8.4000									
11DCE LT 100.0000 246TCP LT 3.6000 CPMSO 65.4000 CLDAN LT 0.0950	CR	LT 24.0000									
11DCE LT 100.0000 24DCLP LT 8.4000 CPMSO2 11.0000 DLDN LT 1.7000	CU	54.4000									
12DCE LT 500.0000 24DMPN LT 4.4000 DITH LT 1.3400 ENDEN 1.9000	K	4620.0000									
12DCE LT 100.0000 24DNP LT 176.0000 DMS 330.0000 ISOR 5.8000	MC	82600.0000									
12DCLP LT 100.0000 2CLP LT 2.8000 OAT LT 2.3600 PPODE 0.6830	NA	460000.0000									
13DCLB LT 100.0000 2MP 118.0000	PB	LT 74.0000									
13DCLP LT 480.0000 2HP LT 8.2000	ZN	53.5000									
13DMP LT 100.0000 4CL3C 76.4000											
2CLEVE LT 350.0000 4MP 106.0000											
ACRYLO LT 840.0000 ALDHN LT 13.0000											
BROCLM LT 100.0000 ATZ LT 5.9000											
CPHCL LT 1200.0000 CLACP LT 54.0000											
CPHCL LT 800.0000 CLDAN LT 37.0000											
CSH6 3020.0000 CPMS LT 10.0000											
CCL3F LT 100.0000 CPMSO LT 15.0000											
CCL4 LT 100.0000 CPMSO2 LT 5.3000											
OCCL2 2830.0000 DBCP GT 300.0000											
OCIBM LT 1400.0000 DCP GT 300.0000											
OCCL LT 120.0000 DVP LT 8.5000											

L.T. - Less than certified reporting limits N.A. - Analysis not requested F - Indicates filtered sample analysis

[illegible]

**DUPLICATE - W0670002 Site ID - 36067**

[illegible]

L.T. = Less Than Certified Reporting Limits      N.A. = Analysis Not Requested      F = Indicates Filtered Sample Analysis

Field number - WC375041	Site ID - 36187	Site type - BORE	Sample Date - 89125 (Julian)
L.T.	N.A.	BTZ LT 2.0400 N.A.	DSCP LT 0.0050 DIMP LT 0.1140 N.A.
CPS	LT 4.4000		Dump LT 0.1330
CPS02	LT 9.0100		
DITH	LT 1.4500		
OxAT	LT 1.7400		
			IMPA LT 2.1100 AS LT 2.5000 HG LT 0.0500 CD LT 0.7400
			IMPA LT 2.0000 CR LT 12.1000
			PB 18.2000
			ZN 38.2000
<b>DUPLICATE - WC375042 Site ID - 36187</b>			
L.T.	N.A.	BTZ LT 2.0400 N.A.	DSCP LT 0.0050 DIMP LT 0.1140 N.A.
CPS	LT 4.4000		Dump LT 0.1330
CPS02	LT 9.0100		
DITH	LT 1.4500		
OxAT	LT 1.7400		
			IMPA LT 2.1100 AS LT 2.5000 D HG LT 0.0500 CD LT 0.7400
			IMPA LT 2.0000 CR LT 15.1000
			CU 7.0400
			PB 20.8000
			ZN 42.3000

L.T. - Less than certified reporting limits      N.A. - Analysis not requested      F - Indicates filtered sample analysis

FIELD NO. - 1085011 CONTINUED[illegible]

11

DATE	TIME	WELL	SAMPLE DATE - JULIAN
1964-07-01	10:00	W1	175
1964-07-02	10:00	W1	176
1964-07-03	10:00	W1	177
1964-07-04	10:00	W1	178
1964-07-05	10:00	W1	179
1964-07-06	10:00	W1	180
1964-07-07	10:00	W1	181
1964-07-08	10:00	W1	182
1964-07-09	10:00	W1	183
1964-07-10	10:00	W1	184
1964-07-11	10:00	W1	185
1964-07-12	10:00	W1	186
1964-07-13	10:00	W1	187
1964-07-14	10:00	W1	188
1964-07-15	10:00	W1	189
1964-07-16	10:00	W1	190
1964-07-17	10:00	W1	191
1964-07-18	10:00	W1	192
1964-07-19	10:00	W1	193
1964-07-20	10:00	W1	194
1964-07-21	10:00	W1	195
1964-07-22	10:00	W1	196
1964-07-23	10:00	W1	197
1964-07-24	10:00	W1	198
1964-07-25	10:00	W1	199
1964-07-26	10:00	W1	200
1964-07-27	10:00	W1	201
1964-07-28	10:00	W1	202
1964-07-29	10:00	W1	203
1964-07-30	10:00	W1	204
1964-07-31	10:00	W1	205
1964-08-01	10:00	W1	206
1964-08-02	10:00	W1	207
1964-08-03	10:00	W1	208
1964-08-04	10:00	W1	209
1964-08-05	10:00	W1	210
1964-08-06	10:00	W1	211
1964-08-07	10:00	W1	212
1964-08-08	10:00	W1	213
1964-08-09	10:00	W1	214
1964-08-10	10:00	W1	215
1964-08-11	10:00	W1	216
1964-08-12	10:00	W1	217
1964-08-13	10:00	W1	218
1964-08-14	10:00	W1	219
1964-08-15	10:00	W1	220
1964-08-16	10:00	W1	221
1964-08-17	10:00	W1	222
1964-08-18	10:00	W1	223
1964-08-19	10:00	W1	224
1964-08-20	10:00	W1	225
1964-08-21	10:00	W1	226
1964-08-22	10:00	W1	227
1964-08-23	10:00	W1	228
1964-08-24	10:00	W1	229
1964-08-25	10:00	W1	230
1964-08-26	10:00	W1	231
1964-08-27	10:00	W1	232
1964-08-28	10:00	W1	233
1964-08-29	10:00	W1	234
1964-08-30	10:00	W1	235
1964-08-31	10:00	W1	236
1964-09-01	10:00	W1	237
1964-09-02	10:00	W1	238
1964-09-03	10:00	W1	239
1964-09-04	10:00	W1	240
1964-09-05	10:00	W1	241
1964-09-06	10:00	W1	242
1964-09-07	10:00	W1	243
1964-09-08	10:00	W1	244
1964-09-09	10:00	W1	245
1964-09-10	10:00	W1	246
1964-09-11	10:00	W1	247
1964-09-12	10:00	W1	248
1964-09-13	10:00	W1	249
1964-09-14	10:00	W1	250
1964-09-15	10:00	W1	251
1964-09-16	10:00	W1	252
1964-09-17	10:00	W1	253
1964-0			

7 - Less than Certified Reporting Limits N.A. - Analysis Not Requested F - Indicates Filtered Sample Analysis

[illegible]

DUPLICATE - WCB90002 SIO ID - 36189

DUPLICATE - WCG0002		Site ID - 36189		Site type - well		Sample Date - 8/15/8		(Julian)																					
111TCE	LT	1.0000	374TCEP	LT	1.7000	8T2	LT	5.0000	ALDHN	8.7000	DQCP	LT	0.1950	DIMP	5900.0000	TDCL	LT	6.6900	FCJA	LT	500.0000	AS	73.1000	D	MC	0.1210	D	CA	1300000.00
112TCE	LT	3.3500	245TCEP	LT	2.8000	CPHS	LT	5.4900	CL6CP	0.0685									INPA	LT	500.0000						CD	LT	8.4000
11DCE	LT	1.0000	246TCEP	LT	3.6000	CPHSO	LT	11.5000	CLD4W	LT	1.0000								INPA	LT	500.0000						CR	LT	24.0000
11DCE	LT	1.0000	24DCLP	LT	8.4000	CPHSOQ		28.0000	DLDM	0.1010									INPA	LT	500.0000						CJ	LT	26.0000
12DCE	LT	7.9400	24DMPN	LT	4.8000	D1TH		2100.0000	ENDRN	0.0696									INPA								K	LT	4940.0000
12DCE	LT	19.1000	24DMP	LT	176.0000	DMSB	LT	0.3500	ISODR	0.2150																	MC	LT	380000.0000
12DCLP	LT	1.0000	2CLP	LT	2.8000	ONAT	LT	0.0540																			NA	LT	1800000.00
13DCLB	LT	1.0000	2MP	LT	3.6000																						PB	LT	74.0000
13DCEP	LT	4.8000	2MP	LT	6.2000																						ZN	LT	22.0000

L.T. - Less Than Certified Reporting Limits    M.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

Table H-4  
Complete listing  
of  
Sample and Duplicate

Volatiles	Soil-volatiles	OSCS	OCPS	DBCP	Dield/DMD	OSCS	IMPA/MPA	Arsenic	Mercury	ICP
										Metals

DUPLICATE - W0390002 continued

CH4 LT 1.0000 CHS LT 10.0000  
CCL3F LT 1.0000 CHS0 LT 15.0000  
CCL4 LT 1.0000 CHS02 LT 5.3000  
CHCL2 LT 1.0000 DBCP LT 12.0000  
CHCLM LT 14.0000 DCP LT 5.5000  
CHCL LT 1.2000 DHP LT 8.5000  
CHCL3 LT 11.0000 DHP LT 200.0000  
CHCL3 2.2000 DITH LT 100.0000  
CLOUS LT 1.0000 DLOM LT 26.0000  
DORCLM LT 1.0000 DHP LT 130.0000  
DCLB LT 2.0000 ENDM LT 18.0000  
ETOMS LT 1.0000 ISOR LT 7.0000  
MEOSHS LT 1.0000 MTH LT 21.0000  
MEK LT 10.0000 DHT LT 142.0000  
MIBK LT 1.4000 PCP LT 9.1000  
TCLEA LT 1.5000 PHEND LT 2.2000  
TCLEE LT 1.0000 PHODE LT 14.0000  
TRCLE 97.0000 PHOD LT 18.0000  
XYLEN LT 2.0000 PETH LT 37.0000  
SUDONA LT 19.0000

Field number - W0390011 Site ID - 36190 Site type - WELL Sample Date - 8/16/86 (Julien)

111TCE LT 200.0000 23ATCP LT 1.7000 BTZ 16.2000 ALDM 2.1000 DBCP 530.0000 DHP 1200.0000 TOCCL LT 67.0000 FCJA LT 1000.0000 AS 400000.0000  
112TCE LT 200.0000 24TCEP LT 2.8000 CHS LT 5.6500 CLOM 21.0000 DHP 1300.0000 IMPA LT 1000.0000 CA LT 8.4000  
11DCE LT 200.0000 24TCEP LT 3.6000 CHS0 30.1000 DLOM LT 0.0500 IMPA LT 1000.0000 CR LT 52.5000  
11DCE LT 200.0000 24DCLP LT 8.4000 CHS02 44.2000 ENDM 2.5000 MPA LT 1000.0000 CU LT 26.0000  
12DCE LT 1000.0000 24DHP LT 4.4000 DITH 9.6500 ISOR 3.2000 K 14000.0000  
12DCE LT 200.0000 24DHP LT 176.0000 DMS 710.0000 PHODE 1.6000 MC 180000.0000  
12DCLP LT 200.0000 2CLP LT 2.8000 DHT 6.0000 PHOD 3.7000 NA 970000.0000  
13DCLB LT 200.0000 2HP LT 3.6000 13DCEP LT 940.0000 2HP LT 8.2000 PB LT 74.0000  
13DHB LT 200.0000 4CL3C LT 8.5000 2CLEVE LT 700.0000 4HP LT 2.8000 ZN 122.0000  
ACET 5930.0000 4HP LT 96.0000

L.T. - Less Than Certified Reporting Limits N.A. - Analysis Not Requested F - Indicates filtered sample analysis



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Table H-4  
Complete listing  
of  
sample and duplicate

Volatiles	Semi-Volatiles	OCs	OCPS	DBCP	DIBP/DiBP	OCMS	IMPA/MPA	Arsenic	Mercury	ICP Metals
FIELD NO - W000011 Continued										
ACRYLO LT 1600.0000 ALDIN LT 13.0000										
BODCLM LT 200.0000 ATZ LT 5.0000										
CHDCL LT 2400.0000 CLCP LT 54.0000										
CHDCL LT 1600.0000 CLDM LT 37.0000										
CHS LT 200.0000 CHS LT 10.0000										
CLCLF LT 200.0000 CHS LT 15.0000										
CLCLF LT 200.0000 CHS LT 39.0000										
CHCLJ 525.0000 DBCP LT 300.0000										
CHCLM LT 200.0000 DCP LT 44.1000										
CHCL LT 240.0000 DCP LT 8.5000										
CHCL3 LT 2200.0000 DHP LT 200.0000										
CHCL3 2600.0000 DTH LT 3.3000										
CLCHS LT 200.0000 DTH LT 26.0000										
DBRCLM LT 200.0000 DHP LT 130.0000										
DCLB LT 400.0000 EPHM LT 16.0000										
ETCHS LT 200.0000 FQDR LT 7.6000										
HECHS LT 200.0000 MTH LT 21.0000										
HEK LT 2000.0000 OAT LT 27.0000										
HTK LT 240.0000 PCP LT 9.1000										
TCLEA LT 300.0000 PHDCL LT 2.2000										
TCLEE LT 200.0000 PPODE LT 14.0000										
TRCLE LT 200.0000 PPODT LT 18.0000										
XTLEN LT 400.0000 PTHM LT 37.0000										
Supma LT 19.0000										
Duplicate - W000012 Site ID - 36190	Site type - Well	Sample Date - 09/166 (Julian)								
111ICE LT 20.0000 234TCP LT 1.7000 B7Z	35.1000 ALDIN	1.8000 DBCP	740.0000 DHP	1100.0000 TOCL	67.0000 FCCA	29.0000 D MC	0.1000 D CA	340000.0000		
112ICE LT 20.0000 243TCP LT 2.8000 CHS	7.0500 CLDM	14.0000	Deep	1200.0000	IMPA LT 1000.0000		CO LT 8.4000			
11DCE LT 20.0000 243TCP LT 3.4000 CHS	42.3000 DLDN	2.1000			MPA LT 1000.0000		CR 70.5000			
11DCE LT 20.0000 243TCP LT 8.4000 CHS	59.4000 EPHM	1.8000					CU 26.3000			
12DCE LT 100.0000 243TCP LT 4.4000 DTH	16.4000 150DR	4.0000					K 19000.0000			
12DCE LT 20.0000 243TCP LT 176.0000 DMS	940.0000 PPODE	1.1000					MC 230000.0000			
12DCE LT 120.0000 243TCP LT 2.4000 OAT	9.2500 PPODT	2.4000					MA 1300000.00			
13DCE LT 20.0000 243TCP LT 3.4000							PH LT 74.0000			
13DCE LT 20.0000 243TCP LT 8.2000							Zn 152.0000			

L.T. - Less than certified reporting limits N.A. - Analysis not requested F - Indicates filtered sample analysis

[illegible]

**DUPLICATE - WCY00012 continued**

ZCLEVE	LT	70.0000	AMP	LT	2.0000
ACE7	LT	160.0000	AMP	LT	96.0000
ACRYLO	LT	168.0000	ALUMN	LT	13.0000
BROCLM	LT	20.0000	ATZ	LT	5.9000
CPHCL	LT	240.0000	CLSCP	LT	54.0000
CPHCL	LT	160.0000	CLDAM	LT	37.0000
CH46	LT	20.0000	CHMS	LT	10.0000
CCL3F	LT	20.0000	CHMSO	LT	15.0000
CCL4	LT	20.0000	CHMSO2	LT	56.0000
CHCL2		404.0000	DSCP	GT	300.0000
CH88	LT	260.0000	DCPO	LT	36.5000
CHCL	LT	24.0000	DDMP	LT	8.5000
CH83	LT	220.0000	D1MP	GT	200.0000
CHCL3		2000.0000	D1TH	LT	3.3000
CLCHMS	LT	20.0000	DLUMN	LT	26.0000
DSRCLM	LT	20.0000	DSMP	LT	120.0000
DCLB	LT	40.0000	ENDRM	LT	10.0000
ETCHMS	LT	20.0000	ISADR	LT	7.0000
HCCHMS	LT	20.0000	MLTHN	LT	21.0000
HEK	LT	200.0000	OMAT	LT	37.0000
MI8K	LT	20.0000	PCP	LT	9.1000
TCLFA	LT	30.0000	PHENOL	LT	2.2000
TCLFE		31.5000	PPDOE	LT	14.0000
TRCLE	LT	20.0000	PPDOT	LT	10.0000
XYLEN	LT	40.0000	PMTHN	LT	37.0000
			SUPONA	LT	19.0000

----- Field number - WC920001      Site ID - 36192      Site type - WELL      Sample Date - 89164 (julian)

[illegible]

L.T. - Less Than Certified Reporting Limits    M.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

[illegible]

T. = less than certified reporting limits    N.A. = analysis not requested    F. = indicates filtered sample analysis

[illegible]

**DUPLICATE - WC925192 CONTINUED**

PP00E	LY	0.0024
PP00T	LY	0.0020

[illegible]

DUPLICATE • WC94S042    SITE ID • 36194    SITE TYPE • BORE    SAMPLE DATE • 89166 (JULIEN)

[illegible]

Field number - WC11W001	Site ID - 36TRENCH1	Site type - WASS	Sample Date - 09117 (Julian)
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
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93	93	93	93
94	94	94	94
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97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

[illegible]

DUPLICATE - WC1W002	SITE ID - 36TRENCH1	SITE TYPE - WASS	SAMPLE DATE - 89117	(JULIAN)
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9
10	10	10	10	10
11	11	11	11	11
12	12	12	12	12
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16	16	16	16	16
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19	19	19	19	19
20	20	20	20	20
21	21	21	21	21
22	22	22	22	22
23	23	23	23	23
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85	85	85	85	85
86	86	86	86	86
87				

L.T.	N.A.	BTZ	LT	9 <sup>000</sup> N.A.	DGCP	0.0315 DIMP	0.2270 N.A.	IMPA	LT	2.1100 AS	LT	2.5000 D MC	LT	0.0500 D CD	LT	0.7600
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L.T. - Less Than Certified Reporting Limits      N.A. - Analysis Not Requested      F - Indicates Filtered Sample Analysis

**DUPLICATE - WC11W002 CONTINUED**

Field number - WCI40001	Site ID - 36TRENCH4	Site type - WASS	Sample Date - 09121 (JULIAN)
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DUPPLICATE - WC14ND02	SITE ID - 36TRENCH14	SITE TYPE - WASS	SAMPLE DATE - 89121	(JULIAN)
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L.L.T. = Less Than Certified Reporting Limits    N.A. = Analysis Not Requested    F = Indicates Filtered Sample Analysis

[illegible]

DUPLICATE - WC14002 CONTINUED

[illegible]

----- field number - WCSWOOD site ID - M-115WASS site type - WASS sample date - 89129 (julian)

[illegible]

L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

[illegible]

L.T. = Less Than Certified Reporting Limits    N.A. = Analysis Not Requested    F = Indicates Filtered Sample Analysis

Violations	Semi-Violations	OCS	OCPs	DSCP	Dimp/Dimp	OCSs	LMPA/LPA	A/Psent/C	F / MFCUR /	F / ICP I / Metals d /
	BK/FANT MD	0.0660								0
	BZALC LT	0.1900								
	C13	0.1470								
	C14	0.2930								
	C15	0.2930								
	C16	0.2930								
	C17	0.2930								
	CHRY MD	0.1200								
	CL6BZ MD	0.0330								
	CL6CP LT	0.6000								
	CL6CP LT	6.2000								
	CL6ET LT	0.1500								
	CLDAN LT	2.0000								
	CPMS LT	0.9000								
	CPMSO LT	0.3000								
	CPMSO2 LT	0.3000								
	DBAHA MD	0.2100								
	DSCP LT	0.3000								
	DPM-C MD	0.2700								
	DEZFLR LT	0.0350								
	DCPD LT	1.0000								
	DDVP LT	3.0000								
	DEP LT	0.2400								
	DIMP LT	1.0000								
	DITH LT	0.4000								
	DLURN LT	0.3000								
	DLURN MD	0.3100								
	Dmp LT	0.1700								
	DnBP MD	0.0610								
	DnOP MD	0.1900								
	ENDRN LT	0.5000								
	ENDRN MD	0.4500								
	ENDRNA MD	0.5300								
	ENDRM MD	0.5300								
	ESTS04 MD	0.8200								
	FANT MD	0.0660								
	FLRENE LT	0.0330								

L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates filtered sample analysis



FIELD NO - WCSW001 CONTINUED

DUPLICATE - WCSV002    SITE ID - M-115WASS    SITE TYPE - WASS    SAMPLE DATE - 8/12/9    (JULIAN)

L. T.	1247CB	L T	0.0400	87Z	L T	2.0400	ALDRN	L T	0.0019	N.A.	DIMP	L T	0.1140	CLCZA	L T	35.5000	N.A.	AS	360000	0000	D	HG	4600	0000	D	CD	1800	0000
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L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

[illegible]

L.T. - Less than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

Volatiles	Semi-volatiles	OSCs	OCPs	DSCP	DMD/Dmp	OSCHS	IMPA/MPA	IATSMIC	F   MFCUTV	F   ICP
	BZCIPE LT	0.2000								
	BXCLLE LT	0.0330								
	BZEHP MD	0.6200								
	BAANTR MD	0.1700								
	BAPVR MD	0.2500								
	BBFANT MD	0.2100								
	BBHC MD	0.2700								
	BBIP MD	0.1700								
	BENSILF MD	0.6200								
	BENZID MD	0.8500								
	BENZO MD	6.1000								
	BHHPY MD	0.2500								
	BKFAHT MD	0.0660								
	BZALC LT	0.1900								
	C12	0.1460								
	C13	0.2960								
	C14	0.2960								
	C15	0.4430								
	C16	0.4430								
	CHRY MD	0.1200								
	CL6BZ MD	0.0330								
	CL6CP LT	0.6000								
	CL6CP LT	6.2000								
	CL6ET LT	0.1500								
	CLDAN LT	2.0000								
	CPMS LT	0.9000								
	CPMSO LT	0.3000								
	CPMSO2 LT	0.3000								
	DBAHA MD	0.2100								
	DBCP LT	0.3000								
	DBHC MD	0.2700								
	DBZFLR LT	0.0350								
	DCPD LT	1.0000								
	DOWP LT	3.0000								
	DEP LT	0.2400								
	DIMP LT	1.0000								
	DITH LT	0.4000								

- Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

Table H-4  
Complete listing  
of  
Sample and duplicate

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	DIHD/DMD	Arsenic	IMPA/MPA	F I MERCURY	F I ICP
DUPLICATE - WCSV002 CONTINUED									
DLDRN LT	0.3000								
DLDRN MD	0.3100								
DMP LT	0.1700								
DMP MD	0.0510								
DNDP MD	0.1900								
DNDP LT	0.5000								
ENDRN MD	0.4500								
ENDRNA MD	0.5300								
ENDRNE MD	0.5300								
ESTS04 MD	0.8200								
FANT MD	0.0640								
FURENE LT	0.0330								
OCLEOR MD	0.3300								
HCB LT	0.3300								
HPCL MD	0.1300								
HPCLE MD	0.3300								
ICOPR MD	0.3900								
ISODR LT	0.3000								
ISOPHR LT	0.0330								
LIN MD	0.2700								
MEXCLR MD	0.3300								
MLTHM LT	0.7000								
NAP LT	0.0370								
NB LT	0.0450								
NDMEA MD	0.1600								
NDNHPA LT	0.7000								
NDOPA MD	0.1900								
OSAT LT	0.3000								
PCB016 MD	1.4000								
PCB221 MD	1.4000								
PCB232 MD	1.4000								
PCB242 MD	1.4000								
PCB248 MD	2.0000								
PCB254 MD	2.3000								
PCB260 MD	2.5000								
PCP MD	1.3000								
PHNTR MD	0.0330								

[illegible]

**DUPLICATE • WOODWARD CONTINUED**

Field number - WCSVSJA01	Site ID - M-1_SOIL-A	Site (Y08 - CMFH)	Sample Date - 8/1/29	(Julian)	AS	HC	32.0000	CD	5.4900
1247CB LT	0.0400 BTZ	LT	2.0400 CL6CP	LT	0.0018 N.A.	DIMP LT	0.1140 CL7A	LT	35.5000 N.A.
120CLB LT	0.1100 CPMS	LT	4.4000		DAMP LT	0.1330 TDCL	LT	4.2000	
120PH NO	0.1400 CPMS02	LT	9.0100						CR
130CLB LT	0.1300 DITH	LT	1.4500						CU
140CLB LT	0.0960 DMS	LT	3.1200						PH
245TCP LT	0.1000 GNAT	LT	1.7400						ZN
246TCP LT	0.1700								
240CLP LT	0.1800								
240PH LT	0.6900								
340NP LT	1.2000								
240NT LT	0.1400								
260NT LT	0.0850								
2CLP LT	0.0600								
20NAP LT	0.0360								
20NAP LT	0.0490								
2NP LT	0.0290								
2NANIL LT	0.0620								
2NP LT	0.1400								
330C80 NO	6.3000								
3NANIL LT	0.4500								
460N2C NO	0.5500								
480NPE NO	0.0330								

L.T. - Less than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates filtered sample analysis

**sample and duplicate**

40MILL LT	0.8100
4CL3C LT	0.0950
4CLPPE LT	0.0350
4MP LT	0.3400
40MILL LT	0.4100
4MP LT	1.4000
4BHC NO	0.2700
4ACKOR NO	0.3300
4ACKOR NO	0.5200
4ADSLN LT	0.3000
4ADSLN LT	0.3300
4ADSLN LT	0.0360
4ANAPPL LT	0.0330
4ANTHC NO	0.0330
4ATZ LT	0.3000
4BCEJHL LT	0.0590
4BCEJPE LT	0.2000
4BCEJPE LT	0.0330
4BCEJPE LT	0.6200
4BAANTR NO	0.1700
4BAANTR NO	0.2500
4BAPVR NO	0.2100
4BAPVR NO	0.2700
4BHC NO	0.1700
4BZP LT	0.1900
4BZP LT	0.6200
4BZP LT	0.8500
4BENZID NO	6.1000
4BENZID NO	0.2500
4BCHIPP NO	0.0660
4BCHIPP NO	0.1900
4BZALC LT	0.1900
4CHRY NO	0.1200
4CL6B NO	0.1300
4CL6B LT	0.6000
4CL6P LT	6.2000
4CL6P LT	0.1500
4CL6P LT	2.0000
4CLM4 LT	0.9000
4CPMS LT	0.2000

L.T. - Less than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

FIELD NO - WCVS401 CONTINUED										
Volatiles	Semi-Volatiles	BSCs	OCPS	DBCP	DIBP/DIBD	OSCS	HPA/HPA	IA/Sonic	F I Mercury	F I ICP Metals
	CPMSO LT	0.3000								
	CPMSOZ LT	0.3000								
	DBAHA MD	0.2100								
	DBCP LT	0.3000								
	DBHC MD	0.2700								
	DBZFLR LT	0.0350								
	DCPD LT	1.0000								
	DDVP LT	3.0000								
	DEP LT	0.2400								
	DIMP LT	1.0000								
	DITH LT	0.4000								
	DLDIN LT	0.3000								
	DLDIN MD	0.3100								
	DMP LT	0.1700								
	DNEP MD	0.0610								
	DNOP MD	0.1900								
	ENDIN LT	0.5000								
	ENDIN MD	0.4500								
	ENDINA MD	0.5300								
	ENDANE MD	0.5300								
	ESFSO4 MD	0.6200								
	FANT MD	0.0640								
	FLURENE LT	0.0330								
	GOLEOR MD	0.3300								
	HCBO LT	0.2300								
	HPCL MD	0.1300								
	HPCLE MD	0.3300								
	ICDPYR MD	0.2900								
	ISODR LT	0.3000								
	ISOPHR LT	0.0330								
	LIM MD	0.2700								
	MICLER MD	0.3300								
	METHN LT	0.7000								
	MAP LT	0.0370								
	MB LT	0.0450								
	MBDEA MD	0.1400								
	MBDHPA LT	0.2000								

L.T. - Less than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

[illegible]

FIELD NO. - W353401 CONTINUED

DUPLICATE - WGSVA02	Site ID - M-1_SOIL-A	Site Type - CPM	Sample Date - 09/29	Julian
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[illegible]

L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis



Table H-4  
Complete listing  
of  
sample and duplicate

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	Dimp/Dmp	OSCS	IMPA/MPA	IArsenic	F I MERCURY	F I ICP
DUPLICATE - WCVS02 CONTINUED										
20E10	0.1010									
2CLP LT	0.0600									
20UAP LT	0.0360									
20UAP LT	0.0490									
2MP LT	0.0290									
20UHL LT	0.0620									
2MP LT	0.1400									
33DCBD NO	6.3000									
20UHL LT	0.4500									
40D42C NO	0.5500									
40B1PE NO	0.0330									
40UHL LT	0.8100									
4CL3C LT	0.0950									
4CLPPE LT	0.0330									
4MP LT	0.2400									
40UHL LT	0.4100									
4MP LT	1.4000									
4BHC NO	0.2700									
40CLOR NO	0.3300									
40SLF NO	0.5200									
ALDRIN LT	0.3000									
ALDRIN NO	0.3300									
ANAPNE LT	0.0360									
ANAPYL LT	0.0330									
ANTHC NO	0.0330									
ATZ LT	0.3000									
BZCEX LT	0.0590									
BZCIPE LT	0.2000									
BZCLEE LT	0.0330									
BZEPH NO	0.5200									
BAANTH NO	0.1700									
BAPNE NO	0.2500									
BIFANT NO	0.2100									
BHC NO	0.2700									
BZP NO	0.1700									
BZSLF NO	0.5200									
BENZID NO	0.8500									

L.T. - Less Than Certified Reporting Limits N.A. - Analysis Not Requested F - Indicates filtered sample analysis

Table H-4  
Complete listing  
of  
Sample and Duplicate

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DIBD/DMBP	OSCHS	IMPA/MPA	Arsenic	F   Mercury	F   ICP Metals
DUPLICATE - WCVS602 CONTINUED										
BENZOA NO	6.1000									
BHIPPY NO	0.3500									
BKXANT NO	0.0660									
BZALC LT	0.1900									
CHRY NO	0.1200									
CL6BZ NO	0.0330									
CL6CP LT	0.6000									
CL6CP LT	6.2000									
CL6ET LT	0.1500									
CL6AW LT	2.0000									
CPMS LT	0.9000									
CPMSO LT	0.3000									
CPMSO2 LT	0.3000									
EBANA NO	0.3100									
DBCP LT	0.3000									
DBHC NO	0.2700									
DBZFLR LT	0.0350									
DCPD LT	1.0000									
DDPP LT	3.0000									
DEP LT	0.2600									
DIMP LT	1.0000									
DITH LT	0.4000									
DLDRN LT	0.3000									
DLDRN NO	0.3100									
DMP LT	0.1700									
DMP NO	0.0610									
DNOP NO	0.1900									
ENDRN LT	0.5000									
ENDRN NO	0.4500									
ENDRNA NO	0.5300									
ENDRNK NO	0.5300									
ESTSOM NO	0.6200									
FANT NO	0.0690									
FLURENE LT	0.0330									
GOXLR NO	0.3300									
HCBZ LT	0.2300									
HPCL NO	0.1300									

L.T. - Less than Certified Reporting Limits N.A. - Analysis not requested F - Indicates filtered sample analysis

[illegible]

APCLE	NO	0.3300
ICOPR	NO	0.2900
ISDOR	LT	0.3000
ISOPR	LT	0.0330
ILILIN	NO	0.2790
MEKCLB	NO	0.3300
HEMLTH	LT	0.7000
ANAP	LT	0.0370
MB	LT	0.0450
ONKSEA	NO	0.1400
WANDPA	LT	0.2000
ONPA	NO	0.1900
OSAT	LT	0.3000
PCB015	NO	1.4000
PCB221	NO	1.4000
PCB323	NO	1.4000
PCB342	NO	1.4000
PCB348	NO	2.0000
PCB354	NO	2.3000
PCB360	NO	2.6000
PCP	NO	1.3000
PHATE	NO	0.0330
PHENDL	LT	0.1100
PPD0	NO	0.3000
PPD02	LT	0.6000
PPD04	NO	0.3100
PPD07	LT	0.5000
PPD08	NO	0.3100
PRTHN	LT	0.9000
PVP	NO	0.0330
SDUPOL	LT	0.6000
THPHN	NO	2.6000

Field number - WCSV5801	Site ID - M-1_SOIL-B	Site type - CPM	Sample Date - 89129	(Julian)
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		DAMP	LT	0.1330	TDCCL	LT	4.2000		CR	21.9000
		112ICE	LT	0.3900	120CCLB	LT	0.1100	CPIAS	LT	4.4000

L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

Table H-4  
Complete listing  
of  
sample and duplicate

Volatiles	Semi-Volatiles	OSCS	OCPS	DBCP	DMD/DMD	IATseric	F I Mercury	F I ICP Metals
FIELD NO - WCVS801 CONTINUED								
11DCLE LT	1.7000 120PH MD	0.1400 CPM502 LT	9.0100					CU 13.6000
12DCE LT	1.7000 12EPCH	0.1120 DITH LT	1.4500					PB 20.4000
12DCE LT	0.5600 130CLB LT	0.1300 DMDS LT	3.1200					ZN 73.2000
1304B LT	0.7400 140CLB LT	0.0940 OXAT LT	1.7400					
8CHPD LT	0.3600 245TCP LT	0.1000						
CH46 LT	0.2500 245TCP LT	0.1700						
CCL4 LT	0.2500 240CLP LT	0.1800						
CHCL2 LT	1.5000 240PH LT	0.6900						
CHCL3 LT	0.2900 240HP LT	1.2000						
CHCL4 LT	1.5000 240HT LT	0.1400						
DBCP LT	2.4000 260HT LT	0.0850						
DCPD LT	0.8160 2CLP LT	0.0600						
DMDS LT	20.0000 20MAP LT	0.0360						
ETCSH5 LT	0.3600 24MAP LT	0.0490						
MECH45 LT	0.2500 2HP LT	0.0290						
MTBC LT	0.7300 24MAP LT	0.0620						
TCLEE LT	0.2500 2HP LT	0.1400						
TRCLE LT	0.5400 3300SD MD	6.3000						
XYLEN LT	4.9000 24MAP LT	0.4500						
	462H2C MD	0.3500						
	488PPE MD	0.0330						
	4C4H11 LT	0.8100						
	4CL3C LT	0.0950						
	4CLPPE LT	0.0330						
	4MP LT	0.2400						
	4MAP LT	0.4100						
	4MP LT	1.4000						
	4BHC MD	0.2700						
	4CHLOR MD	0.3300						
	4EHSLEF MD	0.6200						
	ALDRIN LT	0.3000						
	ALDRIN MD	0.3300						
	ANAPNE LT	0.0360						
	ANAPYL LT	0.0330						
	ANTHC MD	0.0330						
	ATZ LT	0.3000						
	87CE3H LT	0.0590						

L.T. - Less than Certified Reporting Limits N.A. - Analysis Not Requested F - Indicates Filtered sample analysis

PROD NO. 29  
10/05/90

Table H-4  
Complete Listing  
of  
Sample and Duplicate

Volatiles	Semi-Volatiles	OSCS	DCPS	DBCP	DIMD/DMD	OSCS	IMPA/MPA	IArsenic	F Mercury	F ICP Metals
FIELD NO - WCVS001 CONTINUED										
BZCIPE LT	0.2000									
BZCLEE LT	0.0330									
BZEHF NO	0.2000									
BAAATR NO	0.1700									
BAPTR NO	0.2500									
BIFANT NO	0.2100									
BHAC NO	0.2700									
BBLP NO	0.1700									
BENSLF NO	0.2200									
BENZID NO	0.8500									
BENZOA NO	6.1000									
BCHIPP NO	0.2500									
BKANT NO	0.0660									
BZALC LT	0.1900									
CHRY NO	0.1200									
CLBZ NO	0.1200									
CLSCP LT	0.6000									
CLCP LT	6.2000									
CLST LT	0.1500									
CLDAN LT	2.0000									
CPMS LT	0.9000									
CPMSO LT	0.3000									
CPMSO2 LT	0.3000									
DBAUA NO	0.2100									
DBCP LT	0.3000									
DBHC NO	0.2700									
DBZFLR LT	0.0350									
DCPD LT	1.0000									
DDVP LT	3.0000									
DEP LT	0.2400									
DIMP LT	1.0000									
DITH LT	0.4000									
DLDRN LT	0.3000									
DLDRN NO	0.3100									
DMP LT	0.1700									
DMP NO	0.0610									
DNOP NO	0.1900									

L.T. - Less than Certified Reporting Limits N.A. - Analysis not Requested F - Indicates filtered sample analysis

Table H-4  
Complete listing  
of  
sample and duplicate

Volatiles	Soil-Volatiles	OSCS	OCPS	DBCP	DMB/DMD	OSCHS	IMPA/MPA	Arsenic	F Mercury	F ICP Metals
ENORN LT	0.5000									
ENORN MD	0.4500									
ENORNA MD	0.5300									
ENORNA MD	0.5300									
ENORNA MD	0.5300									
ESFS04 MD	0.6200									
FANT MD	0.0680									
FLURENE LT	0.0330									
OCALOR MD	0.3300									
MOB LT	0.2300									
NPCL MD	0.1300									
NPCL MD	0.3300									
ICOPVR MD	0.2900									
ISODR	0.4120									
ISOPHR LT	0.0330									
LIN MD	0.2700									
MECLER MD	0.3300									
METHN LT	0.7000									
NAP LT	0.0370									
NB LT	0.0450									
NADMEA MD	0.1400									
NADHPA LT	0.2000									
NADPA MD	0.1900									
OXAT LT	0.3000									
PCB016 MD	1.4000									
PCB221 MD	1.4000									
PCB232 MD	1.4000									
PCB242 MD	1.4000									
PCB248 MD	2.0000									
PCB254 MD	2.3000									
PCB260 MD	2.6000									
PCP MD	1.3000									
PHANTR MD	0.0330									
PHENOL LT	0.1100									
PPDOD MD	0.3000									
PPDDE LT	0.6000									
PPDDE MD	0.3100									
PPDPT LT	0.5000									

FIELD NO - W03V5801 CONTINUED

Table H-4  
Complete Listing  
of  
Sample and Duplicate

[illegible]

FIELD\_NO - WCSVSB01 CONTINUED

PROPYL MD	0.3100
PRIN L T	0.9000
PYR MD	0.0330
SUPINA LT	0.6000
TXPHEN MD	2.6000

Duplicate - WCS#	Site ID - M-1_Soil-B	Site type - CUPH	Sample Date - 8/1/29	(Julian)
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[illegible]

L.T. - Less Than Certified Reporting Limits      N.A. - Analysis Not Requested      F - Indicates Filtered Sample Analysis

Table H-4  
Complete listing  
of  
sample and duplicate

[illegible]

L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis



[illegible]

**DUPLICATE • WCVS02 CONTINUED**

L.T. = Less than Certified Reporting Limits    N.A. = Analysis Not Requested    F - Indicates Filtered Sample Analysis

DUPLICATE - WCSVS802 CONTINUED

Field number - WCD15041	Site ID - W1504E001	Site type - SCRF	Sample date - 89144 (Julian)
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L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis

FIELD NO. - WCD15041 CONTINUED

TCLEE	LT	0.2500
TRCLE	LT	0.5400
TOYEN	LT	4.5000

FLUORIDATE - WCD15042	SITE ID - WCDREF001	SITE TYPE - BORE	SAMPLE DATE - 89144 (JULIAN)
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[illegible]

----- field number - W0035071 site ID - M1B0R0003 site type - BORE sample date - 09150 (julian)

N.A.	N.A.	N.A.	N.A.	N.A.
L.T.	L.T.	N.A.	A.S	M.C
			110.0000	0.1590
			N.A.	N.A.

DUPPLICATE - W0013072      \$119 ID - IN BORE003      \$119 YOE - BORE      Sample Date - 89150 (Julian)

[illegible]

----- Field number - W05S041      Site ID - M1B0RE005      Site type - BORE      Sample Date - 89145 (Julian)

[illegible]

**L.T. - Less Than Certified Reporting Limits    N.A. - Analysis Not Requested    F - Indicates Filtered Sample Analysis**

----- Field number - WCD6D191    Site ID - W1809E006    Site type - BORE    Sample Date - 89143 (julian)

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DUPLICATE - W0660192	Site ID - M7600006	Site type - BORE	Sample Date - 89143 (julian)
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99	99	99	99
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N.A.	L.T.	N.A.	N.A.	N.A.	N.A.	A5	12.9000 D MC	2.6000 D N.A.
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----- Field number - W066W041 S/I# ID - W1808E006 S/I# IY09 - BORE SAMP/Q Date - 89143 (Julian)
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[illegible]

L.T. = Less Than Certified Reporting Limits    N.A. = Analysis Not Requested    F = Indicates Filtered Sample Analysis

Table H-4  
Complete listing  
of  
Sample and Duplicate

Volatiles	Semi-volatiles	OSCS	OCPS	DBCP	Dmp/Dmp	IMPA/MPA	Arsenic	F   MERCURY	F   ICP
									Metals

FIELD NO - W0404041 continued

DMS LT 20.0000 1500R LT 0.3000  
ETCASH LT 0.3000 MLTHM LT 0.7000  
MECASH LT 0.2500 GSAT LT 0.3000  
MIBK LT 0.7300 PPODE LT 0.6000  
TCLEE LT 0.2500 PPODT LT 0.5000  
TRCLE LT 0.5400 PRTM LT 0.9000  
XYLEN LT 4.9000 SUPONA LT 0.6000

DUPLICATE - W0404042 Site ID - W0404046 Site type - BORE Sample Date - 89143 (Julian)

111TCE LT 0.4300 L.T.  
112TCE LT 0.3900  
112CLE LT 1.7000  
120CE LT 1.7000  
120CLE LT 0.5400  
130MB LT 0.7400  
BO-PD 0.8210  
CASH LT 0.2500  
CCL4 LT 0.2500  
CHCL3 LT 1.5000  
CHCL3 LT 0.2900  
CLOASH LT 1.5000  
DBCP LT 2.4000  
DCPD LT 0.6400  
DMS LT 20.0000  
ETCASH LT 0.3000  
MECASH LT 0.2500  
MIBK LT 0.7300  
TCLEE LT 0.2500  
TRCLE LT 0.5400  
XYLEN LT 4.9000

BTZ LT 2.0400 ALDHN LT 0.0019 N.A.  
CPMS LT 4.4000 CL6CP LT 0.0018  
CPMS02 LT 9.0100 CLDAN LT 0.0230  
DITH LT 1.4500 DLDMN LT 0.0033  
DMS LT 3.1200 ENDMN LT 0.0058  
GSAT LT 1.7400 1500R LT 0.0011  
PPODE LT 0.0024  
PPODT LT 0.0020

N.A.  
CL2A LT 35.5000 N.A.  
TDCL LT 4.2000

AS 6500.0000 D MC 4000.0000 D CD 870.0000  
CR LT 6.5000  
CU LT 8.8700  
PB LT 8.4000  
Zn 18.7000

**APPENDIX I**  
**WELL DEVELOPMENT SUMMARY TABLE**

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# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36001

Installation Date: NA

Well Description: 4-in. PVC

Volume Calculation:  $(29.5 - 11.7) \times 0.653 + (29.5 - 11.7) \times 0.591$   
 1 Vol = 22.1 gal  
 5 Vol = 110.5 gal

Ground Elevation: 5263.3 feet  
 Depth to Water, BGS: 11.7 feet  
 Elevation: 5251.7 feet  
 Depth to Bottom, BGS: 29.52 feet  
 Elevation: 5233.8 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-2-89		Bail	15	15	7.22	710	yellow-gray	E. Gonzalez
			25	40	7.17	1300	light yellow	
			15	60	7.12	1330	light yellow	
			20	80	7.08	1320	light yellow	
			30	110	7.09	1300	light yellow	
			20	130	7.23	1250	light gray	E. Gonzalez
5-5-89		Pump	35	165	7.12	1240	clear	
			NA	165	NA	NA	NA	E. Gonzalez
	5-5-89	Bail	25	25	7.19	1310	milky-brown	K. Doeden
		Bail	41	66	7.22	1280	lt. milky-brown	
6-7-89			47	113	7.15	1270	lt. milky-brown	
			NA	113	NA	NA	NA	K. Doeden
	6-7-89	Bail						

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36054  
 Installation Date: NA  
 Well Description: 2-in. PVC

Ground Elevation: 5259.3 feet  
 Depth to Water: 8GS: 7.8 feet  
 Elevation: 5251.5 feet  
 Depth to Bottom: 8GS: 21 feet  
 Elevation: 5238.3 feet

Volume Calculation:  $(21 - 7.8) \times 0.163 + (21 - 7.8) \times 0.726$   
 1 Vol = 11.7 gal  
 5 Vol = 58.6 gal

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
6-8-89		Pump	1.5/dry	1.5	7.66	2,700	NA	T. Terry
			1.0/dry	2.5	7.85	5,700	NA	
			2/dry	4.5	8.13	6,900	NA	T. Terry
6-9-89		Pump	2/dry	6.5	NA	NA	NA	J. Dodson
6-12-89		Pump	0.75/dry	7.25	NA	NA	lime green	
			2.5/dry	9.75	7.73	3,250	NA	T. Terry
	6-13-89	Bail	2/dry	11.75	7.53	3,500	NA	J. Dodson



# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36055

Ground Elevation: 5252.3 feet

Installation Date: NA

Depth to Water; BGS: 8.1 feet

Elevation: 5244.2 feet

Well Description: 2-in. PVC

Depth to Bottom; BGS: 24.7 feet

Elevation: 5227.6 feet

Volume Calculation:  $(24.7 - 8.1) \times 0.163 + (24.7 - 8.1) \times 0.726$

1 Vol = 14.8 gal

5 Vol = 73.8 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-9-89		Pump	1 1.5/dry	1	7.36	9,900	NA	T. Terry
			0.5/dry	2.5	NA	NA	NA	
			0.5/dry	3.0	7.74	11,800	NA	
			0.5/dry	3.5	7.86	13,000	NA	
			2.5/dry	6.0	7.24	9,700	NA	
			3/dry	9.0	7.0	10,000	NA	
			2.5/dry	11.5	7.51	9,100	black	
			NA	11.5	7.4	10,200	NA	
6-9-89		Pump						T. Terry
6-12-89		Bail						T. Terry
6-13-89		Bail						J. Dodson
	6-13-89	Bail						T. Terry
		Bail						T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36058

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(20.2 - 1) \times 0.163 + (20.2 - 1) \times 0.726$   
 1 Vol = 17 gal  
 5 Vol = 85.3 gal

Ground Elevation: 5254.2 feet  
 Depth to Water; BGS: 1 foot  
 Elevation: 5253.2 feet  
 Depth to Bottom; BGS: 20.2 feet  
 Elevation: 5234 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-5-89		Pump	0.5 9.5 35 30 15	0.5 10 45 75 90	7.48 7.44 7.40 7.40 NA	13,700 13,600 13,000 13,000 NA	brown brown yellow yellow NA	T. Terry
6-12-89		Pump	Initial 60 25	NA 150 175	7.05 6.90 NA	12,000 12,800 NA	brown lime green NA	J. Dodson
	6-12-89	Bail	Initial 7 Bails 10 Bails	NA 7 Bails 17 Bails	7.35 7.43 7.42	12,200 11,800 11,800	NA NA NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36067

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(15.1 - 6.9) \times 0.163 + (15.1 - 6.9) \times 0.726$   
 $1 \text{ Vol} = 7.3 \text{ gal}$   
 $5 \text{ Vol} = 36.5 \text{ gal}$

Ground Elevation: 5241.2 feet  
 Depth to Water; BGS: 6.9 feet  
 Elevation: 5234.3 feet  
 Depth to Bottom; BGS: 15.1 feet  
 Elevation: 5226.1 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-26-89		Pump	7 13 16 Initial	7 20 36 36	6.9 6.76 6.72 6.82	2600 2720 2720 2780	clear clear clear gray	E. Gonzalez   E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36075

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(15.7 - 9.4) \times 0.163 + (15.7 - 9.4) \times 0.726$

1 Vol = 5.6 gal

5 Vol = 28 gal

Ground Elevation: 5253.3 feet

Depth to Water; BGS: 9.4 feet  
Elevation: 5243.9 feet

Depth to Bottom; BGS: 15.7 feet  
Elevation: 5237.6 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-15-89		Bail	Initial	Initial	7.85	1670	NA	T. Terry
			7	7	7.93	1600	NA	
			8	15	7.88	1630	NA	
			10	25	7.86	1630	NA	
			4	29	NA	NA	NA	T. Terry
	6-15-89	Bail	NA	29	NA	NA	NA	

\* Well 36075 was sampled on 4 different occasions: 4-18-89; 6-2-89; 6-6-89; 6-15-89

Ground Elevation: 5252.4 feet  
Depth to Water; BGS: 13 feet  
Elevation: 5239.4 feet  
Depth to Bottom; BGS: 15.4 feet  
Elevation: 5237 feet

**Volume Calculation:**  $(15.4 - 13) \times 0.163 + (15.4 - 13) \times 0.726$   
 1 Vol = 2.1 gal  
 5 Vol = 10.7 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-5-89		Pump	1	1	7.27	3,150	tan	T. Terry
			3/dry	4	NA	NA		
			1	5	7.02	3,820	tan	
			6/dry	11	7.19	3,900	tan	
			Initial	11	7.16	3,450	clear	T. Terry
			3	14	7.21	3,200	brown	
6-14-89		Bail	3	17	7.25	3,200	NA	
			3	20	NA	NA	NA	
			NA	NA	NA	NA	NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Ground Elevation: 5243.7 feet  
 Depth to Water; BGS: 14.2 feet  
 Elevation: 5229.5 feet  
 Depth to Bottom; BGS: 23.2 feet  
 Elevation: 5220.5 feet

Well No.: 36080

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(23.2 - 14.2) \times 0.163 + (23.2 - 14.2) \times 0.726$   
 1 Vol = 8 gal  
 5 Vol = 40 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-1-89		Pump	3	3	7.39	12,200	lt. gray	E. Gonzalez
			5	8	7.46	11,500	lt. gray	
			2 dry	10	NA	NA	NA	
			2	12	7.13	11,000	clear	
			4 dry	16	7.14	11,300	clear	
	5-1-89	Bail	NA	16	NA	NA	NA	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36084  
 Installation Date: NA  
 Well Description: 2-in. PVC  
 Ground Elevation: 5236 feet  
 Depth to Water; BGS: 6.7 feet  
 Elevation: 5229.3 feet  
 Depth to Bottom; BGS: 12.3 feet  
 Elevation: 5223.7 feet

Volume Calculation:  $(12.3 - 6.7) \times 0.163 + (12.3 - 6.7) \times 0.726$   
 1 Vol = 5 gal  
 5 Vol = 25 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-13-89		Pump	23	23	NA	NA	NA	B. Hedenkamp
4-24-89		Bail	5	28	7.12	15,600	NA	B. Hedenkamp
			10	38	7.04	15,500	NA	
			5	43	NA	NA	NA	
			5	48	NA	NA	NA	
	4-25-89	Bail	Initial	48	7.22	15,500	NA	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36085

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(13.3 - 1.7) \times 0.163 + (13.3 - 1.7) \times 0.726$   
 $1 \text{ Vol} = 10.3 \text{ gal}$   
 $5 \text{ Vol} = 51.5 \text{ gal}$

Ground Elevation: 5230.2 feet  
 Depth to Water; BGS: 1.7 feet  
 Elevation: 5228.5 feet  
 Depth to Bottom; BGS: 13.3 feet  
 Elevation: 5216.9 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-2-89		Pump	10	10	7.43	790	NA	E. Gonzalez
			10	20	7.54	790	NA	
			15	35	7.36	800	NA	
			10	45	7.41	790	NA	
			10	55	7.41	790	NA	
	5-2-89	Bail	NA	55	NA	NA	NA	E. Gonzalez



# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36087

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(15.4 - 10.7) \times 0.163 + (15.4 - 10.7) \times 0.726$   
 1 Vol = 4.2 gal  
 5 Vol = 21 gal

Ground Elevation: 5258.6 feet  
 Depth to Water; BGS: 10.7 feet  
 Elevation: 5247.9 feet  
 Depth to Bottom; BGS: 15.4 feet  
 Elevation: 5243.2 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-26-89		Bail	2/dry 1/dry	2 3	7.67 7.31	800 810	NA NA	E. Gonzalez
4-27-89		Bail	Initial 1/dry	3 4	7.95 7.97	680 780	NA NA	E. Gonzalez
			1/dry	5	7.95	780	NA	
			1/dry	6	7.89	770	NA	
			1	7	7.88	780	NA	
	4-27-89	Bail	NA	7	NA	NA	NA	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36088

Installation Date: NA

Well Description: 2-in. PVC

Volume Calculation:  $(25.2 - 16) \times 0.163 + (25.2 - 16) \times 0.726$

1 Vol = 8.2 gal

5 Vol = 41 gal

Ground Elevation: 5243.8 feet

Depth to Water; BGS: 16 feet  
Elevation: 5227.8 feet

Depth to Bottom; BGS: 25.2 feet  
Elevation: 5218.6 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-28-89		Pump	4	4	7.52	10,800	gray	E. Gonzalez
			4/dry	8	NA	NA	NA	
			2	10	7.59	11,200	lt. gray	
			2/dry	12	NA	NA	NA	
			4/dry	16	7.58	11,300	lt. gray	
4-28-89		Bail	4/dry	20	7.66	11,200	lt. gray	E. Gonzalez
				NA	20	NA	NA	

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36167  
 Installation Date: 1-2-87  
 Well Description: 4-in. PVC  
 Ground Elevation: 5254.1 feet  
 Depth to Water; BGS: 10.5 feet  
 Elevation: 5243.6 feet  
 Depth to Bottom; BGS: 16.8 feet  
 Elevation: 5237.3 feet

Volume Calculation:  $(16.8 - 10.5) \times 0.653 + (16.8 - 10.5) \times 0.591$   
 1 Vol = 7.8 gal  
 5 Vol = 39.2 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-14-89		Pump	3 9/dry 12/dry 13/dry	3 12 24 37	8.2 NA 8.3 8.27	6,000 NA 6,000 6,200	NA NA clear NA NA NA	T. Terry
	6-14-89	Bail	2 NA	39 39	NA NA	NA NA	NA NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36180  
 Installation Date: NA  
 Well Description: 4-in. PVC

Ground Elevation: 5235.8 feet  
 Depth to Water; BGS: 7.86 feet  
 Elevation: 5227.9 feet

Depth to Bottom; BGS: 25.7 feet  
 Elevation: 5210.1 feet

Volume Calculation:  $(25.7 - 7.86) \times 0.163 + (25.7 - 7.86) \times 0.591$   
 $1 \text{ Vol} = 22.2 \text{ gal}$   
 $5 \text{ Vol} = 111 \text{ gal}$

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-27-89		Bail	20	20	7.32	10,200	NA	E. Gonzalez
			25	45	7.28	10,100	NA	
			15	60	7.38	10,400	NA	
4-28-89		Bail	35	95	7.15	10,000	NA	E. Gonzalez
			25	120	7.33	10,000	NA	
	4-28-89	Bail	NA	120	NA	NA	NA	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36187  
 Installation Date: 5-8-89  
 Well Description: 4-in. PVC  
 Ground Elevation: 5241.5 feet  
 Depth to Water; BGS: 13.8 feet  
 Elevation: 5227.7 feet  
 Depth to Bottom; BGS: 21.6 feet  
 Elevation: 5219.9 feet

Volume Calculation:  $(21.6 - 13.8) \times 0.653 + (21.6 - 13.8) \times 0.591$   
 1 Vol = 9.7 gal  
 5 Vol = 48.5 gal

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
5-16-89		Pump	10.5/dry	10.5	7.62	6500	NA	D. Bufo
5-18-89		Pump	17.5/dry	28	7.48	5700	NA	D. Bufo
6-7-89		Pump	10/dry	38	7.36	600	NA	T. Terry
			8/dry	46	7.36	5100	NA	
			8/dry	54	7.43	6000	NA	
			5/dry	59	7.44	5700	NA	
	6-7-89	Bail	NA	59	NA	NA	NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36188

Installation Date: 5-4-89

Well Description: 4-in. PVC

Volume Calculation:  $(22 - 11.9) \times 0.653 + (22 - 11.9) \times 0.591$

1 Vol = 12.5 gal

5 Vol = 62.5 gal

Ground Elevation: 5240.2 feet  
Depth to Water; BGS: 11.9 feet  
Elevation: 5228.3 feet  
Depth to Bottom; BGS: 22 feet  
Elevation: 5218.2 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-18-89		Bail	1	1	6.99	15,900	orange/brown	D. Bufo
			14	15	NA	NA	NA	
5-22-89		Pump	10.5	25.5	7.03	17,000	clear	D. Bufo
6-7-89			Initial	25.5	7.44	11,200	brown	T. Terry
		Pump	5	30.5	7.01	15,500	NA	
			2/dry	32.5	NA	NA	NA	
			12	44.5	6.97	15,000	NA	
	6-7-89	Bail	NA	44.5	NA	NA	NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36189  
 Installation Date: 5-2-89  
 Well Description: 4-in. PVC

Ground Elevation: 5239.9 feet  
 Depth to Water: BGS: 11.3 feet  
 Elevation: 5228.6 feet  
 Depth to Bottom: BGS: 22.9 feet  
 Elevation: 5217 feet

Volume Calculation:  $(22.9 - 11.3) \times 0.653 + (22.9 - 11.3) \times 0.591$   
 1 Vol = 14.4 gal  
 5 Vol = 72 gal

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
5-4-89		Bail	16	16	7.27	990	orange/brown	E. Gonzalez
5-5-89		Bail	12	28	7.55	1,100	yellow	E. Gonzalez
5-16-89		Initial	Initial	28	7.52	9,000	orange/brown	E. Gonzalez
		Bail	11	39	7.40	11,000	orange/brown	
		Bail	12/dry	51	7.02	12,000	brown	T. Terry
6-6-89		Pump	0.5/dry	51.5	7.23	16,900	brown	
			12.5/dry	64	7.06	11,900	brown	
			8	72	7.11	12,100	brown	
	6-7-89	Bail	NA	72	NA	NA	NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36190

Installation Date: 4-26-89

Well Description: 4-in. PVC

Volume Calculation:  $(19.9 - 8.7) \times 0.653 + (19.9 - 8.7) \times 0.591$   
 1 Vol = 13.9 gal  
 5 Vol = 69.5 gal

Ground Elevation: 5239.7 feet  
 Depth to Water; BGS: 8.7 feet  
 Elevation: 5231 feet  
 Depth to Bottom; BGS: 19.9 feet  
 Elevation: 5219.8 feet

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
5-1-89		Bail	12	12	7.39	7,000	NA	E. Gonzalez
			4	16	NA	NA	NA	
5-2-89		Bail	16	32	7.38	7,000	NA	E. Gonzalez
5-4-89		Bail	15/dry	47	7.41	6,700	NA	E. Gonzalez
5-5-89		Bail	14/dry	61	7.58	8,000	NA	E. Gonzalez
6-5-89		Bail	6	6	7.09	7,700	NA	K. Doeden
			4	10	7.21	7,200	NA	
			5	15	7.16	6,950	NA	
6-6-89		Bail	Initial	15	7.20	6,350	NA	K. Doeden
		Bail	5	20	7.15	6,950	NA	
6-15-89	6-6-89	Bail	Initial	20	7.23	7,100	NA	T. Terry
			15/dry	35	NA	NA	NA	
			2	37	7.25	7,100	NA	
			5	42	NA	NA	NA	
	6-15-89	Bail	NA	42	NA	NA	NA	T. Terry



# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36191

Installation Date: 5-11-89

Well Description: 4-in. PVC

Volume Calculation:  $(38.3 - 35) \times 0.653 + (38.3 - 35) \times 0.591$   
 1 Vol = 4.1 gal  
 5 Vol = 20.5 gal

Ground Elevation: 5248.3 feet  
 Depth to Water; BGS: 35 feet  
 Elevation: 5213.3 feet  
 Depth to Bottom; BGS: 38.3 feet  
 Elevation: 5210 feet

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
5-24-89		Bail	1.5	1.5	8.37	4,200	clear	D. Bufo
6-2-89		Bail	5.5	7.0	7.83	4,400	NA	T. Terry
6-6-89		Bail	2.5/dry	9.5	7.16	5,000	NA	K. Doeden
6-8-89		Bail	Initial	9.5	7.27	4,500	NA	T. Terry
			2.5/dry	12.0	NA	NA	NA	
			0.5/dry	12.5	7.21	4,360	NA	T. Terry
6-9-89	6-12-89	Bail	NA	12.5	7.32	4,400	NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36192

Installation Date: 5-19-89

Well Description: 4-in. PVC

Ground Elevation: 5253.7 feet

Depth to Water; BGS: 29.6 feet  
Elevation: 5224.1 feet

Depth to Bottom; BGS: 65.6 feet  
Elevation: 5188.1 feet

Volume Calculation:  $(65.6 - 26.6) \times 0.653 + (65.6 - 29.6) \times 0.591$   
1 Vol = 44.8 gal  
5 Vol = 224 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-22-89		Bail	1	1	7.47	3,400	clear	D. Bufo
5-23-89		Bail	34/dry	35	NA	NA	NA	
5-24-89		Bail	25/dry	60	NA	NA	NA	D. Bufo
		Bail	2	62	7.5	2,900	clear	D. Bufo
6-5-89		Bail	28/dry	90	NA	NA	NA	
6-6-89		Bail	45/dry	135	7.13	3,800	brown	K. Doeden
		Bail	25	160	7.13	3,450	brown	K. Doeden
6-8-89		Bail	4	164	NA	NA	NA	
		Bail	1	165	7.29	2830	clear	T. Terry
		Bail	41	206	7.30	3,070	brown	
6-9-89		Pump	5	211	NA	NA	NA	T. Terry
		Pump	3	214	7.11	2,940	NA	
6-9-89		Pump	25	239	7.22	3,000	dk. brown-black	T. Terry
6-12-89		Bail	2/dry	241	NA	NA	NA	
		Bail	1	242	7.26	3,000	clear	T. Terry
		Bail	22	264	7.36	2,900	brown-black	
		Bail	18/dry	282	NA	NA	NA	
		Bail	7/dry	289	7.31	3,090	black	
		Bail	6/dry	295	7.42	3,050	NA	
	6-13-89	Bail	NA	295	7.25	2,970	NA	T. Terry

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36193

Installation Date: 5-17-89

Well Description: 4-in. PVC

Volume Calculation:  $(16.6 - 9) \times 0.653 + (16.6 - 9) \times 0.591$   
 1 Vol = 9.5 gal  
 5 Vol = 47.3 gal

Ground Elevation: 5261.8 feet  
 Depth to Water: BGS: 9 feet  
 Elevation: 5252.8 feet  
 Depth to Bottom: BGS: 16.6 feet  
 Elevation: 5245.2 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-23-89		Pump	10	10	8.5	2300	Brown	D. Bufo
			7/dry	17	NA	NA	NA	
5-24-89		Bail	20	37	NA	NA	Brown	D. Bufo
5-30-89		NA	6	43	7.35	1600	Brown	J. Dodson
			14/dry	57	7.62	1600	Brown	
			5	62	7.78	NA	Brown	
			1	63	NA	NA	NA	
6-7-89		Bail	9	72	7.61	1700	Brown	K. Doeden
			18	90	7.63	1560	Brown	
			13	103	7.77	1500	Brown	
			14	117	7.72	1600	Brown	
			9	126	7.69	1610	Brown	
			NA	126	NA	NA	NA	K. Doeden
6-15-89	6-7-89	Bail Pump	1	1	7.35	1800	NA	J. Dodson
			14/dry	15	NA	NA	NA	
			10	25	7.76	1490	NA	
			22	47	7.75	1500	NA	
	6-15-89	Bail	NA	47	NA	NA	NA	J. Dodson

# WELL DEVELOPMENT SUMMARY TABLE

Ground Elevation: 5254.3 feet  
 Depth to Water; BGS: 13.5 feet  
 Elevation: 5240.8 feet  
 Depth to Bottom; BGS: 23.6 feet  
 Elevation: 5228.7 feet

Well No.: 36194

Installation Date: 6-16-89

Well Description: 4-in. PVC

Volume Calculation:  $(23.6 - 13.5) \times 0.653 + (23.6 - 13.5) \times 0.591$   
 1 Vol = 12.6 gal  
 5 Vol = 62.8 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-19-89		Bail	20	20	7.96	6,000	NA	T. Terry
			10/dry	30	NA	NA	NA	
			15/dry	45	NA	NA	NA	
			5	50	7.83	6,800	NA	
			3/dry	53	NA	NA	NA	
6-20-89		Bail	0	53	7.90	6,200	clear	T. Terry
			17	70	NA	NA	NA	
			10	10	7.44	6,900	NA	
			10	20	NA	NA	NA	
			10/dry	30	8.33	7,900	NA	
7-13-89		Pump	10	40	NA	NA	NA	D. Bufo
			10/dry	40	NA	NA	NA	
			NA	40	NA	NA	NA	
	7-13-89	Bail						

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36590  
 Installation Date: NA  
 Well Description: 4-in. PVC  
 Ground Elevation: 5250.6 feet  
 Depth to Water; BGS: 10.5 feet  
 Elevation: 5240.1 feet  
 Depth to Bottom; BGS: 27.80 feet  
 Elevation: 5222.8 feet

Volume Calculation:  $(27.8 - 10.5) \times 0.653 + (27.8 - 10.5) \times 0.591$   
 1 Vol = 21.5 gal  
 5 Vol = 107.5 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-14-89		Pump Bail NA	10 5/dry 1	10 15	NA	NA	NA	B. Kedenkamp
4-25-89			4	16 20	7.03 7.17	1,600 1,640	yellow yellow	E. Gonzalez
	4-26-89	Bail	4/dry NA	24 24	NA 7.39	NA 1,600	NA light yellow	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36591  
 Installation Date: NA  
 Well Description: 4-in. PVC

Ground Elevation: 5248.5 feet  
 Depth to Water; BGS: 6 feet  
 Elevation: 5242.5 feet  
 Depth to Bottom; BGS: 25.7 feet  
 Elevation: 5222.8 feet

Volume Calculation:  $(25.7 - 6) \times 0.653 + (25.7 - 6) \times 0.591$   
 1 Vol = 24.5 gal  
 5 Vol = 122.5 gal

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
4-19-89		Bail	15/dry	15	NA	NA	NA	B. Hedenkamp
4-20-89		Bail	5	20	NA	NA	NA	B. Hedenkamp
4-25-89		Bail	5	25	NA	NA	NA	E. Gonzalez
		Bail	13/dry	30	6.87	1,410	yellow	E. Gonzalez
		Bail	Initial	43	7.45	1,450	yellow	E. Gonzalez
	4-26-89	Bail		43	7.37	1,300	lt. yellow	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 36593  
 Installation Date: NA  
 Well Description: 4-in. PVC  
 Ground Elevation: 5248 feet  
 Depth to Water; BGS: 6 feet  
 Elevation: 5242 feet  
 Depth to Bottom; BGS: 27.1 feet  
 Elevation: 5220.9 feet

Volume Calculation:  $(21.7 - 6) \times 0.653 + (27.1 - 6) \times 0.591$   
 1 Vol = 26.3 gal  
 5 Vol = 131.2 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
4-19-89		Pump	15	15	NA	NA	clear	B. Hedenkamp
4-20-89		Bail	2	17	8.08	1,550	NA	B. Hedenkamp
4-24-89		Bail	6	23	8.35	NA	NA	B. Hedenkamp
		Bail	1	24	NA	NA	NA	B. Hedenkamp
		Bail	9	33	7.85	1,270	NA	B. Hedenkamp
		Bail	1	34	7.77	1,330	NA	B. Hedenkamp
	4-25-89	Bail			7.62	1,270	clear	E. Gonzalez

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 01077

Installation Date: 1-3-89

Well Description: 4-in. PVC

Volume Calculation: NA

Ground Elevation: 5263.5 feet

Depth to Water; BGS: NA  
Elevation: NA

Depth to Bottom; BGS: 88.7 feet  
Elevation: 5174.8 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-2-89		Pump	Initial 0.27 0.28 0.13 0.32 1.0 1.0 1.0	Initial 0.27 0.55 0.68 1.0 2.0 3.0 4.0 5.0 NA	7.31 7.59 7.59 7.62 7.66 7.70 7.70 7.70 7.68 5.0	850 1100 1100 1100 1100 1130 1150 1150 1170 NA	clear clear clear clear clear clear clear clear clear NA	S. Morrisette
	6-2-89	Bail						S. Morrisette

\* Well was purged by Harding Lawson Associates prior to sampling by MCC. HLA supplied pump; all well parameter data was collected by HLA.



# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 01083  
 Installation Date: 5-12-89  
 Well Description: 4-in. PVC  
 2-in. prepack installed 6-20-89

Ground Elevation: 5264.7 feet  
 Depth to Water; BGS: 8.2 feet  
 Elevation: 5256.5 feet  
 Depth to Bottom; BGS: 16 feet  
 Elevation: 5248.7 feet

Volume Calculation:  $(16 - 8.2) \times 0.653 + (16 - 8.2) \times 0.591$   
 $1 \text{ Vol} = 9.7 \text{ gal}$   
 $5 \text{ Vol} = 48.5 \text{ gal}$

Date Purged	Date Sampled	Method Purged	Amount Removed (gal)	Cumulative Total (gal)	pH	Conductivity	Color	Geologist
5-23-89		Pump	6	6	7.43	1400	Brown	D. Bufo
5-24-89		Bail	15	21	NA	NA	NA	D. Bufo
5-26-89		Bail	20/dry	41	6.89	1050	Brown	J. Dodson
			10	51	7.10	1000	NA	
			20	71	NA	NA	NA	
			2	73	7.14	1000	NA	J. Dodson
5-30-89		Pump	3.1/dry	76.1	NA	NA	NA	
			16	92.1	7.22	1190	NA	T. Terry
6-9-89		Bail	Initial	92.1	7.34	1100	NA	
			17	109.1	7.38	1080	Brown	J. Dodson
6-12-89		Pump	Initial	109.1	7.10	1330	NA	
			10/dry	119.1	NA	NA	NA	
			6/dry	125.1	NA	NA	NA	J. Dodson
6-12-89		Pump/Bail	17/dry	142.1	7.2	1300	NA	J. Dodson
		Bail	0.5	142.6	7.5	1100	NA	
	6-13-89							

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 01503

Installation Date: NA

Well Description: 4-in. PVC

Volume Calculation:  $(19.5 - 7.6) \times 0.653 + (19.5 - 7.6) \times 0.591$

1 Vol = 14.8 gal

5 Vol = 74 gal

Ground Elevation: 5263.5 feet  
Depth to Water; BGS: 7.6 feet  
Elevation: 5255.9 feet  
Depth to Bottom; BGS: 19.5 feet  
Elevation: 5244 feet

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
6-1-89		Pump	Initial 40/dry	Initial 40	11.95	1800	NA	S. Morrisette
6-2-89		Pump	18/dry	58	11.98	1900	NA	
			16/dry	74	11.68	1810	NA	S. Morrisette
	6-2-89	Bail	0	74	11.62	1720	NA	
					11.59	1800	NA	S. Morrisette

\* Well was pumped dry 3 times 6-1-89. Volumes No. 1 & No. 2 were not noted.

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 01504  
 Installation Date: NA  
 Ground Elevation: 5263.3 feet  
 Depth to Water; BGS: 8 feet (5-3-89)  
 7.5 feet (5-31-89)  
 Elevation: 5255.3 feet  
 5255.8 feet  
 Well Description: 4-in. PVC  
 Depth to Bottom; BGS: 18.9 feet  
 Elevation: 5244.4 feet

Volume Calculation:  $(18.9 - 8) \times 0.653 + (18.9 - 8) \times 0.591$   
 1 Vol = 13.6 gal  
 5 Vol = 67.8 gal  
 $(18.9 - 7.5) \times 0.653 + (18.9 - 7.5) \times 0.591$   
 1 Vol = 14.2 gal  
 5 Vol = 71 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-3-89		Pump	15	15	12.4	5200	NA	B. Hedenkamp
			10	25	12.4	6000	NA	
			10	35	12.5	5900	NA	
			2	37	NA	NA	NA	
	5-3-89	Bail	NA	37	NA	NA	NA	B. Hedenkamp
		Pump	28/dry	28	12.61	6600	NA	S. Morrisette
5-31-89			14/dry	42	NA	NA	NA	
			13/dry	55	12.57	6200	NA	
			16	71	NA	NA	NA	
	5-31-89	Bail	NA	71	NA	NA	NA	S. Morrisette

# WELL DEVELOPMENT SUMMARY TABLE

Well No.: 01524  
 Installation Date: NA  
 Well Description: 4-in. PVC  
 Ground Elevation: 5263 feet  
 Depth to Water; BGS: 5.3 feet  
 Elevation: 5257.7 feet  
 Depth to Bottom; BGS: 22.3 feet  
 Elevation: 5240.7 feet

Volume Calculation:  $(22.3 - 5.3) \times 0.653 + (22.3 - 5.3) \times 0.591$   
 1 Vol = 21.1 gal  
 5 Vol = 105.7 gal

<u>Date Purged</u>	<u>Date Sampled</u>	<u>Method Purged</u>	<u>Amount Removed (gal)</u>	<u>Cumulative Total (gal)</u>	<u>pH</u>	<u>Conductivity</u>	<u>Color</u>	<u>Geologist</u>
5-25-89		Bail*	5	5	7.89	1000	brown	J. Dodson
			15	20	8.22	830	brown	
			15	35	8.06	900	brown	
			25	60	8.16	900	brown	
			11	71	NA	NA	NA	
	5-25-89	Bail	NA	71	NA	NA	NA	J. Dodson

\* Well was bailed dry twice while purging. Volumes when well went dry were not noted.

**APPENDIX J**  
**SOIL AND GAS SAMPLING RESULTS**

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SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO  
 CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans DCE	1,2 cis DCE	1,1 DCE	BEN- ZENE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
F87JULY89 SAMPLING TRAIN	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	
F87JULY89 ATMOSPHERIC	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	
G5 @ 5'	0.05	0.01	0.01	0.02	0.06	0.02	0.05	0.15	0.05	
G5 @ 10'	0.50	<0.01	<0.01	0.01	0.03	0.01	0.03	0.04	0.03	
G5 @ 15'A	0.35	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	0.02	0.01	
G5 @ 15'B	0.41	<0.01	<0.01	<0.01	0.04	<0.01	0.03	<0.01	<0.01	
G5 5.5 @ 15'A	23.9	<0.01	0.57	<0.01	0.09	<0.01	0.03	<0.01	<0.01	
G5 5.5 @ 15'B	25.8	<0.01	0.83	<0.01	0.07	<0.01	0.05	0.01	0.07	0.02
G5 5.5 @ 10'	36.3	<0.01	0.04	<0.01	0.02	0.01	0.04	0.01	0.04	0.01
G5 5.5 @ 5'	16.8	<0.01	0.02	<0.01	<0.01	0.01	0.03	0.01	0.03	0.02
H5 @ 15'	11.2	0.01	0.01	0.01	0.02	0.03	0.05	0.05	0.12	0.05
G5 5.5 @ 20'	24.4	0.05	1.19	<0.01	0.05	0.03	0.04	0.03	0.10	0.04
H5 @ 10'A	8.22	0.01	<0.01	<0.01	<0.01	0.01	0.09	0.03	0.06	0.02
H5 @ 10'B	8.73	<0.01	<0.01	<0.01	<0.01	0.01	0.04	0.01	0.04	0.01
H5 @ 5'	10.3	0.02	0.01	0.03	0.06	0.03	0.05	0.04	0.10	0.05
G5 5.25 @ 10'	22.4	<0.01	0.24	<0.01	0.08	0.02	0.08	0.03	0.08	0.04

LOCATION	TCE	1,2 trans DCE	1,2 cis DCE	1,1 DCE	BEN- ZENE	TOLUENE ETHYL M & P O- BENZENE XYLENES XYLENE	COMMENTS

FS8JULY SAMPLING TRAIN	0.01	<0.01	<0.01	<0.01	<0.01	0.10	0.29	0.06	0.21	0.08
FS8JULY ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.05	0.01	0.04	0.02
GS 5.25 @ 15'	16.4	<0.01	0.07	<0.01	<0.01	0.11	0.05	0.01	0.02	0.01
GS 5.75 @ 15'	19.1	<0.01	3.13	0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
GS 5.5 @ 15'	2.54	<0.01	<0.01	0.03	<0.01	0.03	0.08	0.03	0.09	0.04
GS 6 @ 15'	5.30	<0.01	<0.01	0.01	<0.01	0.03	0.14	0.03	0.03	0.07
GS 6 @ 15'	7.08	<0.01	<0.01	<0.01	<0.01	0.03	0.08	0.03	0.09	0.01
G7 @ 15'A	1.91	<0.01	<0.01	0.01	<0.01	0.03	0.09	0.07	0.16	0.09
G7 @ 15'B	2.26	<0.01	<0.01	0.02	<0.01	0.03	0.09	0.05	0.16	0.08
G2.5-5.5 @ 15'A	4.07	<0.01	0.04	<0.01	<0.01	0.04	0.12	0.04	0.13	0.05
G2.5-5.5 @ 15'B	3.92	<0.01	0.03	<0.01	<0.01	0.04	0.09	0.03	0.09	0.05
GS 5 @ 15	8.95	<0.01	<0.01	<0.01	<0.01	0.10	0.03	0.06	0.21	0.08
GS 5 @ 5'B	0.22	<0.01	<0.01	<0.01	<0.01	0.01	0.11	0.04	0.15	0.06

SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO  
 CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans DCE	1,2 cis DCE	1,1 DCE	BEN- ZENE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
502.2										
G5 5.25 @ 10'8	25.5	<0.01	0.07	<0.01	<0.01	0.01	<0.01	0.04	0.09	0.45ug/l 1,1,1 TCA & 0.01 PCE
502.2										
G5 5 @ 15'8	10.0	<0.01	<0.01	<0.01	0.05	0.12	0.11	0.29	0.15	3.66 ug/l 1,1,1 TCA
502.2										
F88JULY II SAMPLING TRAIN	<0.01	<0.01	<0.01	<0.01	0.03	0.28	0.31	0.98	0.40	
F88JULY89 II ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	0.08	0.07	0.02	0.07	0.03	
I1 @ 15'	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.07	0.09	0.05	PCE = 1.31 ug/l
I2 @ 15'	<0.01	<0.01	<0.01	<0.01	0.02	0.05	0.03	0.11	0.07	PCE = 0.75 ug/l
I3 @ 15'	<0.01	<0.01	<0.01	<0.01	0.03	0.05	0.03	0.06	0.04	
H8 @ 15'	0.80	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.06	0.01	
F8 @ 15'	0.32	<0.01	<0.01	0.03	<0.01	0.01	0.05	0.06	0.01	
I6 @ 15'A	0.05	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.05	0.01	
I6 @ 15'B	0.06	<0.01	<0.01	<0.01	0.02	0.03	0.01	0.06	0.01	
I4 @ 15'	0.02	<0.01	<0.01	<0.01	0.04	0.05	0.02	0.04	<0.01	
I5 @ 15'	1.11	<0.01	<0.01	0.02	<0.01	0.01	0.02	0.06	0.06	
F89JULY89 SAMPLING TRAIN	<0.01	<0.01	<0.01	<0.01	0.06	0.04	0.05	0.04	0.01	



SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO  
 CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans DCE	1,2 cis DCE	1,1 DCE	BEN- ZENE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
FB9JULY89 ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	0.01	0.09	0.08	0.02	0.06	0.02
F6 @ 15'	3.25	<0.01	<0.01	<0.01	0.02	0.05	0.01	0.01	0.01	0.02
I7 @ 15'	0.23	<0.01	<0.01	<0.01	0.02	0.28	0.01	0.01	0.03	0.01
F4 @ 15'	<0.01	<0.01	<0.01	0.06	<0.01	0.01	0.05	0.02	0.05	0.03
D5 @ 15'	<0.01	<0.01	<0.01	0.02	<0.01	0.01	0.01	0.09	0.03	0.04
D7 @ 15'	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.07	0.03	0.03	0.03
D10 @ 15'	<0.01	<0.01	<0.01	<0.01	0.01	0.07	0.05	0.01	0.05	0.03
F10 @ 15'	1.04	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.01	0.05	0.03
FB9JULY89 II SAMPLE TRAIN	0.01	<0.01	<0.01	<0.01	0.03	0.17	0.09	0.31	0.10	
FB9JULY89 II ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.01	0.02	0.01	0.01
F14 @ 15'	1.82	<0.01	<0.01	<0.01	0.01	0.04	0.02	0.10	0.04	0.04
D14 @ 15'	0.01	<0.01	<0.01	<0.01	0.01	0.03	0.02	0.05	0.04	0.04
FB10JULY89 ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	0.01	<0.10	0.02	0.01	0.01	0.01
FB10JULY89 SAMPLE TRAIN	<0.01	<0.01	<0.01	<0.01	0.06	0.11	0.03	0.08	0.03	
I12 @ 15'	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.01	0.02	0.01	0.01
I8 @ 15'A	0.03	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.03	0.02	0.02
I8 @ 15'B	0.03	<0.01	<0.01	<0.01	0.01	0.04	0.01	0.03	0.01	0.01

SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO

CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans cis DCE -DCE	1,2 DCA	1,1 DCE	BEN- NE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
H5.5 @ 15'	12.2	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.03	0.01	
H12 @ 15'	0.01	<0.01	<0.01	<0.01	0.01	0.04	0.04	0.03	0.01	
H5 @ 15'	13.7	<0.01	<0.01	<0.01	0.02	0.02	0.08	0.02	0.01	
G0.75-5.5 @ 15'8	154	0.05	19.9	<0.01	0.05	ND	0.27	.25	0.11	ND = NOT DETECTED, BURIED IN TCE
F810JULY II SAMPLE TRAIN	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.01	
F810JULY II ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
D12 @ 15'	0.02	<0.01	<0.01	0.02	<0.01	0.01	0.01	0.04	0.01	
F12 @ 15'	1.61	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.04	0.02	
D8 @ 15'	0.01	<0.01	<0.01	<0.01	0.01	0.04	0.01	0.04	0.01	
F811JULY29 SAMPLING TRAIN	<0.01	<0.01	<0.01	<0.01	0.06	0.10	0.03	0.09	0.03	
F811JULY39 ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	0.16	0.22	0.06	0.17	0.06	
J10 @ 15'	0.02	<0.01	<0.01	<0.01	0.02	0.08	<0.01	<0.01	0.05	
H4 @ 15'	1.67	<0.01	<0.01	<0.01	0.80	0.05	0.05	0.09	0.01	
H7 @ 15'	1.05	0.06	0.05	0.02	0.08	0.08	0.08	0.05	0.04	
G8 @ 15'	2.88	<0.01	<0.01	0.01	<0.01	0.03	0.06	0.30	0.02	
G4 @ 15'	0.02	0.01	<0.01	0.01	0.05	0.08	0.03	0.05	0.03	

SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO  
 CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans DCE	1,2 cis DCE	1,2 DCA	1,1 DCE	BEN- ZENE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
E3 @ 15'	0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.07	0.03	0.07	0.02	
J8 @ 15'	0.02	<0.01	<0.01	0.02	<0.01	0.04	0.05	0.06	0.06	0.02	
J5 @ 15'A	0.06	<0.01	<0.01	<0.01	0.02	0.02	0.03	0.01	0.04	0.01	
J5 @ 15'B	0.06	<0.01	<0.01	<0.01	0.02	0.03	0.04	0.02	0.08	0.01	
F811JULY II	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.15	0.06	0.15	0.05	
SAMPLE TRAIN											
C12 @ 15'	0.02	<0.01	<0.01	0.01	<0.01	0.04	0.05	0.07	0.09	0.03	
F16 @ 15'	0.20	<0.01	<0.01	0.01	<0.01	0.03	0.05	0.05	0.09	0.03	
F18 @ 15'	0.01	<0.01	<0.01	0.01	<0.01	0.03	0.04	0.03	0.09	<0.01	
F812JULY89	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	0.20	0.04	0.13	0.05	
SAMPLING TRAIN											
F812JULY89	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.04	0.01	0.03	0.01	
ATMOSPHERIC											
G10 @ 15'	0.39	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.04	0.02	
G5.9-5.7 @ 15'B	268	0.03	2.61	<0.01	0.03	0.01	0.01	0.02	0.03	0.01	
G5.60-5.70	603	<0.01	27.9	<0.01	<0.01	0.03	ND	0.01	0.03	0.01	ND - NOT DETECTED, BURIED IN TCE PEAK
F813JULY89	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.09	0.02	0.05	0.02	
ATMOSPHERIC											
G14 @ 15'	0.68	<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.04	0.10	0.04	
G12 @ 15'	1.38	<0.01	<0.01	0.02	<0.01	0.02	0.03	0.04	0.09	0.03	

SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO  
 CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans DCE	1,2 cis DCE	1,1 DCE	BEN- ZENE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
D16 @ 15'	0.14	<0.01	<0.01	<0.01	<0.01	0.03	0.02	0.04	0.01	
D18 @ 15'	0.50	<0.01	<0.01	<0.01	0.02	0.03	0.03	0.07	0.02	
E14 @ 15'	0.83	<0.01	<0.01	<0.01	0.02	0.03	0.02	0.05	0.02	
E16 @ 15'	0.38	<0.01	<0.01	<0.01	0.03	0.04	0.03	0.06	0.05	
E7 @ 15'	0.01	<0.01	<0.01	<0.01	0.02	0.02	0.02	0.04	0.02	
H3 @ 15'A	0.01	<0.01	<0.01	0.52	0.02	0.02	0.02	0.04	0.01	
H3 @ 15'B	0.01	<0.01	<0.01	0.22	0.02	0.01	0.04	0.05	0.02	
FBI3JULY89 SAMPLING	0.04	<0.01	<0.01	0.03	<0.01	0.02	0.07	0.14	0.06	
TRAIN										
FBI3JULY89 II ATM	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.01	<0.01	
B19 @ 15'	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.05	0.03	
E10 @ 15'	0.06	<0.01	<0.01	0.01	<0.01	0.01	0.01	0.03	0.01	
H16 @ 15'	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.03	0.01	
FBI4JULY89 SAMPLING	<0.01	<0.01	<0.01	<0.01	0.04	0.06	0.03	0.09	0.04	
TRAIN										
FBI4JULY89 ATMOSPHERIC	<0.01	<0.01	<0.01	<0.01	0.04	0.12	0.03	0.03	0.58	
E12 @ 15'	0.21	<0.01	<0.01	0.02	<0.01	0.03	0.06	0.12	0.04	
C16 @ 15'	0.02	<0.01	<0.01	0.07	<0.01	0.01	0.02	0.05	0.03	

SOIL GAS AND SOIL SAMPLING RESULTS  
 ROCKY MOUNTAIN ARSENAL  
 COMMERCE CITY, CO  
 CONC'S REPORTED IN ug/l FOR SOIL GAS AND ug/kg FOR SOIL

LOCATION	TCE	1,2 trans cis DCE DCE	1,2 DCA	1,1 DCE	BEN- ZENE	TOLUENE	ETHYL BENZENE	M & P XYLENES	O- XYLENE	COMMENTS
H4.5 @ 15'	0.03	<0.01	<0.01	0.38	0.02	0.02	0.03	0.08	0.02	1,1,1 TCA
G5.6-5.7 @ 30'A	95.4	<0.01	<0.01	<0.01	0.08	0.15	0.08	0.24	0.08	50.0ML SAMPLE
G5.6-5.7 @ 30'B	69.9	<0.01	<0.01	<0.01	0.04	0.06	0.04	0.10	0.04	100.0ML SAMPLE
G5.6-5.7 2 15'A	140	<0.01	<0.01	<0.01	0.08	0.08	0.08	0.17	0.08	50.0ML SAMPLE
G5.6-5.7 2 15'B	107	<0.01	<0.01	<0.01	0.02	ND	<0.01	0.02	<0.01	100.0 SAMPLE
G5.6-5.7 @ 5'	298	<0.01	17.2	<0.01	<0.01	0.03	0.02	0.06	0.03	ND = NOT DETECTED BURIED IN TCE PEAK
FBI4JULY II SAMPLE TRAIN	0.35	<0.01	<0.01	0.04	<0.01	0.04	0.07	0.13	0.06	
FBI4JULY II ATMOSPHERIC	0.13	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.01	
G5.6-5.7 @ 15'A	136	<0.01	18.9	0.04	0.43	0.08	0.12	0.20	0.12	50.0ML SAMPLE
G5.6-5.7 @ 15'B	87.5	<0.01	14.8	0.10	0.12	0.08	0.01	0.01	0.01	100.0ML SAMPLE
H2O BLANK	<0.01	0.09	<0.01	<0.01	<0.01	0.13	0.01	0.18	0.09	
RINSATE # 1	<0.01	<0.01	<0.01	<0.01	<0.01	0.27	1.00	2.55	1.30	
G5.6-5.7 @ 151	151	<0.01	3.54	<0.01	<0.01	1.44	3.68	4.94	9.20	

## COMMENTS

[illegible]

APPENDIX K  
TARGET ANALYTES LIST

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APPENDIX K

Method

Organo Sulphur Compounds/GCFPD

Analyte

DMDS	Dimethyl Disulfide
OXAT	Oxathiane
DITH	Dithiane
BTZ	Benzothiazole
CPMS	4-Chlorophenylmethyl sulfide
CPMSO	4-Chlorophenylmethyl sulfoxide
CPMSO2	4-Chlorophenylmethyl sulfone

Method

Volatile Aromatic Organic Compounds/GCFPD

Analyte

C6H6	Benzene
MEC6H5	Toluene
CLC6H5	Chlorobenzene
ETC6H5	Ethylbenzene
13DMB	1,3-Dimethylbenzene/M-xylene
XYLEN	Xylenes
12DCLB	1,2-Dichlorobenzene
13DCLB	1,3-Dichlorobenzene
14DCLB	1,4-Dichlorobenzene

Method

Semivolatile Organic Compounds/GCMS

Analyte

13DBD4	1,3-Dichlorobenzene-D4
2CLPD4	2-Chlorophenol-D4
ALDRN	Aldrin
ATZ	Atrazine
CL6CP	Hexachlorocyclopentadiene
CLDAN	Chlordane
CPMS	4-Chlorophenylmethyl Sulfide



## Woodward-Clyde Consultants

CPMSO	4-Chlorophenylmethyl Sulfoxide
CPMSO2	4-Chlorophenylmethyl Sulfone
DBCP	Dibromochloropropane
DCPD	Dicyclopentadiene
DDVP	Vapona
DEPD4	Diethyl Phthalate-D4
DIMP	Diisopropylmethyl Phosphonate
DITH	Dithiane
DLDRN	Dieldrin
DMMP	Dimethylmethyl Phosphate
DNOPD4	DI-N-Octyl Phthalate-D4
ENDRN	Endrin
ISODR	Isodrin
MLTHN	Malathion
OXAT	1,4-Oxathiane
PPDDE	2,2-BIS (Para-Chlorophenyl)-1,1-Dichloroethene
PPDDT	2,2-BIS (Oara-Chlorophenyl)-1,1,1-Trichloroethane
PRTHN	Parathion
SUPONA	Supona/2-Chloro-1-(2,4-Dichlorophenyl) Vinyl Diethyl Phosphate

### Method

#### Organochlorine Pesticides/GCECD

#### Analyte

ALDRN	Aldrin
CL6CP	Hexachlorocyclopentadiene
CLDAN	Chlordane
DLDRN	Dieldrin
ENDRN	Endrin
ISODR	Isodrin
PPDDE	2,2-BIS (Para-Chlorophenyl)-1,1-Dichloroethese
PPDDT	2,2-BIS (Para-Chlorophenyl)-1,1,1-Trichloroethane

### Method

#### Dibromochloropropane/GCECD

#### Analyte

DBCP	Dibromochloropropane
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### Method

#### Volatile Halogenated Organic Compounds/GCCON

Analyte

BCHPD	Bicyclo [2,2,1] Hepta-2,5-Diene
DCPD	Dicyclopentadiene
MIBK	Methylisobutyl Ketone

Method

Volatile Organic Compounds/GCMS

Analyte

111TCE	1,1,1-Trichloroethane
TCLEA	1,1,2,2-Tetrachloroethane
112TCE	1,1,2-Trichloroethane
11DCLE	1,1-Dichloroethane
11DCE	1,1-Dichloroethylene/1,1-Dichloroethene
DCLB	1,2-Dichlorobenzene and 1,4-Dichlorobenzene
12DCLE	1,2-Dichloroethane
12DCD4	1,2-Dichloroethane-D4
12DCE	1,2-Dichloroethylenes (CIS and Trans Isomers)
12DCLP	1,2-Dichloropropane
13DCLB	1,3-Dichlorobenzene
13DCP	1,3-Dichloropropane
2CLEVE	2,Chloroethylvinyl Ether/(2-Chloroethoxy) Ethene
C6H6	Benzene
BRDCLM	Bromodichloromethane
CHBR3	Bromoform
CCL4	Carbon Tetrachloride
CLC6H5	Chlorobenzene
C2H5CL	Chloroethane
CH3CL	Chloromethane
DBRCLM	Dibromochloromethane
CHCL3	Chloroform
ETBD10	Ethylbenzene-D10
CH2CL2	Methylene Chloride
CD2CL2	Methylene Chloride-D2
TCLEE	Tetrachloroethylene/Tetrachloroethene
MEC6D8	Toluene-D8
TRCLE	Trichloroethylene/Trichloroethene
C2H3CL	Chloroethene/Vinyl Chloride
ACRYLO	Acrylonitrile
CCL3F	Trichlorofluoromethane
13dmb	1,3-Dimethylbenzene/M-Xylene
Xylen	Xylenes
ACET	Acetone
MEK	Methylethyl Ketone/2-Butanone
MIBK	Methylisobutyl Ketone

## Woodward-Clyde Consultants

CH3BR	Bromomethane
MEC6H5	Toluene
ETC6H5	Ethylbenzene
DMK	Dimezhylketone

### Method

#### Volatile Hydrocarbon Compounds/GCFID

### Analyte

BCHPD	Biocyclo [2,2,1] Hepta-2,5-Diene
DCPD	Dicyclopentadiene
MIBK	Methylisobutyl Ketone

### Method

#### Metals/ICP

### Analyte

CA	Calcium
CD	Cadmium
CR	Chromium
CU	Copper
K	Potassium
MG	Magnesium
NA	Sodium
PB	Lead
ZN	Zinc

### Method

#### Arsenic/AA

### Analyte

AS	Arsenic
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### Method

#### Mercury/AA

### Analyte

HG	Mercury
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